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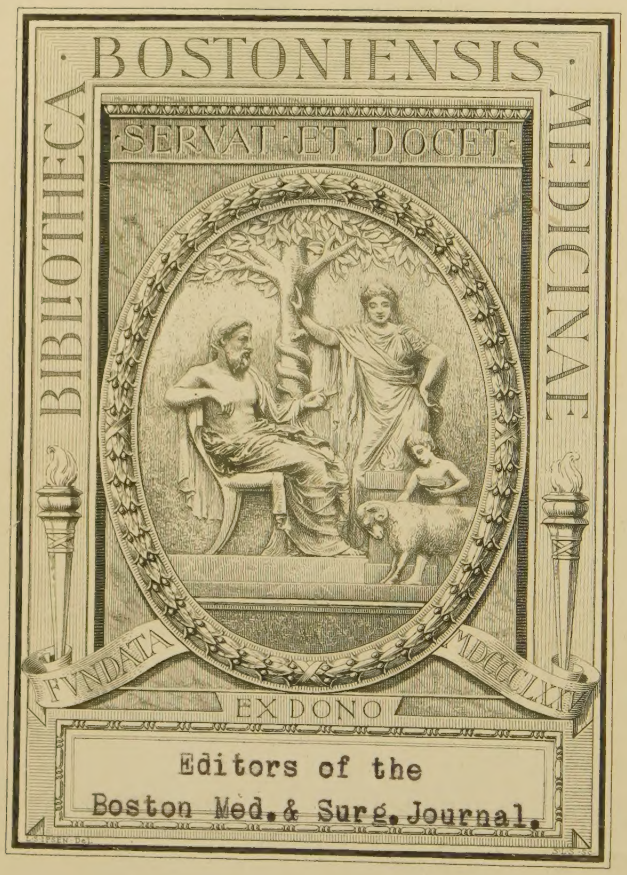
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Fig. 1.—An extreme result from the wearing of ill-fitting shoes (case of Dr. J. W. Perkins).

PRACTICE OF MEDICINE FOR NURSES

A TEXT-BOOK FOR NURSES AND STUDENTS OF DOMESTIC SCIENCE, AND A HAND-BOOK FOR ALL THOSE WHO CARE FOR THE SICK

BY

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WITH A CHAPTER ON

THE TECHNIC OF NURSING

BY

PEARL L. LAPTAD

PRINCIPAL OF THE TRAINING SCHOOL FOR NURSES OF THE UNIVERSITY OF KANSAS

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PREFACE

THE purpose of this book is to provide for those who care for the sick either professionally or in the home such information as shall be most helpful in following the directions of the medical attendant, and in caring for emergencies. The limits of the book have not permitted a discussion of all possible diseases, nor of the minutiæ of diagnosis and therapy of those described. Furthermore, because it is the author's belief that the nurse should neither diagnose nor prescribe, little space has been given to differential diagnosis and the dosage of remedies.

Nursing as a profession is just finding its field and its limitations; and if this book shall help some few nurses to find more easily their niches—and help them to fill them more completely—the author will feel repaid for his labor.

The author's thanks are offered his associates who have so kindly assisted in the work.

G. H. H.

KANSAS CITY,
January, 1908.

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PRACTICE OF MEDICINE FOR NURSES.

CHAPTER I.

HEALTH AND DISEASE.

"Health is a state of physical, mental and moral equilibrium, a normal functionating of body, mind and soul. It is the state when work is a pleasure, when the world looks good and beautiful, and the battle of life seems worth while. Health is the antithesis of disease, degeneracy and crime.

"The laws of health are as inexorable as the law of gravitation, as exacting as eternal justice, as relentless as fate, and their violation is the beginning and cause of all disease, suffering and sin.

"Health is the most desired of earthly blessings. When finally lost, it cannot be purchased by uncounted millions, restored by the alienist, or returned by the pulpit."—S. J. CRUMBINE.

Some one has said that he alone is healthy who does not know that he has a body. While this, of course, is an exaggeration, it nevertheless gives us one good standpoint for the beginning of our study. Our bodies, in other words, should be such good machines that their running should cause no creaking or jolting. Health, then, is an absence of disease.

This brings us face to face with the necessity of defining disease,—a matter over which generations of priests, philosophers, and physicians have cudgeled their brains in vain. The barbaric and earliest idea of disease is that when sick we are possessed of evil spirits. We find this view among the Chinese, among the Indian tribes, and the records of such belief in the Bible; even into what we are proud to term modern times has this belief in demoniac possession extended.

The next step made by the searchers after truth led them to believe that the essence of our bodies lies in the fluids or "humors," and, therefore, when these fluids are in bad condition, the body suffers,—the patient is "in a bad humor." Analogous to this theory was that found away back in the time of the Greeks when Homer speaks of his heroes being filled with black bile—for the Greeks believed that bile was one of these intrinsic humors, and that when it became black, the patient showed signs of melancholy, and was subject to fits of anger. Again, it is interesting to find Shakespeare make his characters fear to "suck up the dank humors of the night," by venturing out of doors, and thereby contaminate their own body fluids.

Really scientific views of disease could not exist until a fairly accurate knowledge of the structure and functions of the organs of the body was obtained. This did not come about until the middle of the nineteenth century. Then, when it was found that the unit of structure in the body of man as in the body of a tree or of an animal is the cell, and that in disease changes are to be found in the cells of the body, mankind obtained a basis for learning what disease is, and for curing it. Nevertheless, the ancients were not so far wrong in their observations because changes in the chemistry of the blood and the other fluids do occur in disease, although in most diseases these changes are the result and not the cause of the disease. But we have yet to find that in disease our bodies are possessed by external or foreign spirits,—although we are often tempted to call some exhibitions of temper and temperament on the part of our acquaintances demoniacal.

Disease, then, is an alteration of the structure and function of cells and groups of cells, produced in some cases by chemical poisons introduced from without the body; sometimes by poisons formed within the body itself by the fermentation of foods or the activity of germs. But,

even in this latter case, the ultimate source of the disorder is without the body. Even where this alteration in structure is as yet not fully demonstrated—as in insanity—we have evidence to prove that such an alteration exists. So, likewise, such an intangible affair as nervousness has as its basis a change in structure or function of body cells.

Therefore, before we can treat disease we must learn the changes that have occurred in the body cells, and must learn if possible the cause of those changes. Hence, for the last half century the chief effort of the medical profession has been to study the anatomic changes found in disease on the one hand, and on the other to trace out the action of the various poisons both physiologic and chemical, in order that physicians may recognize and counteract their activities. When, then, the cause of any condition can be ascertained, it is the physician's first duty to remove it. Thus, if he finds a patient suffering from an intestinal parasite, he should at once take measures to destroy that parasite and repair its damage. When we cannot ascertain the cause, then the best we can do for our sufferers is to obtund their sense of pain and stimulate their bodies to overcome the noxious influence. To say that all disease is due to a violation of law may be true, but since the violation may have been committed by our parents, it is not always helpful to raise the point—any more than it was in poor Job's case. Nevertheless, if we can obey the laws of health (and no one is excused by ignorance), we shall be healthier—and our children also—for it. Thus, we can avoid overwork, gluttony, self-indulgence, and one-sidedness in life in general, and not only we, but our neighbors also, will be happier for it.

Many diseases are caused by germs; and these are being scattered broadcast by our careless neighbors. To this category belong the so-called contagious diseases. It is, therefore, a duty that we owe our neighbors, even if we have no care for ourselves, to stop the ravages of

noxious germs and cut short their careers. We ought not, therefore, to think of the ordinary diseases of children lightly and permit the children to be exposed needlessly to them, because each case tends to continue and perpetuate the disease even if it does not injure markedly that particular patient.

CHAPTER II.

THE CURE OF DISEASE.

Since disease is essentially some influence or thing from the outside world working upon or interfering with the functions of the human organism, the cure of disease is always twofold in character. First, the outside influence or thing must be removed; and, second, the organism must be supported in the performance of its normal functions until the results of the outside influence have disappeared.

Our bodies are what they are because their present constitution and action has most successfully resisted the attacks of the outside world through the long centuries of development. The fittest has always survived. This applies to cell-type and organ just as much as it does to the body as a whole. Therefore, we may expect to find within the human organism some ability at least to combat the more usual types of foes with which it has had to contend. Such foes are the minute organisms which we call bacteria and germs, which not only injure the body by deriving their food from it, but also injure the body by excreting into it products of their own cell activity. These cell products are even more toxic than the chemical poisons, such as arsenic and strychnin, with which we are all familiar. Our bodies, in order to combat these bacteria, have had both to destroy the organisms and neutra-

lize their poisons or toxins. Therefore, it has come to pass that when a small quantity of germs is introduced into the body (as, for instance, when they are clinging to a piece of glass and the glass cuts down into the flesh), the tissues of the body begin immediately to manufacture chemical compounds or substances (*antitoxins*) that in their turn act poisonously upon the invaders. This antitoxin is a highly complex chemical compound, which floats in the blood-stream, is easily destroyed by heat, and is poisonous for only one species of germ, and neutralizes only one kind of bacterial toxin. In the same way, bacteria living in the intestines may excrete a toxin which when absorbed by the blood-vessels will cause fever and paralyze the nerves. As soon as this toxin makes its entrance into the blood, however, there begins to be formed and set loose in the blood-stream also, the antitoxin which neutralizes the bacterial toxin.

This chemical resistance, however, is not the only defense that we have against pathogenic germs. There is also the process called *phagocytosis*. That is, when a few germs enter the blood-stream, they are sought after and engulfed by the white blood-corpuscles, which possess the so-called amebic movement.

Of course, this power of the body to defend itself against living bacteria is limited; but the power develops with the demand—provided the attack be not too sudden and overwhelming. For these anti-bodies are developed by cellular activity and are not kept stored in reservoirs ready to be poured out, as a snake pours out venom, at a moment's notice. Naturally, such a struggle requires all the strength of the entire body. Therefore, it is very important to the body that it be not called upon to perform much other work while it is making a fight for life with a host of invading germs.

We may say then that when the body is in good condition to begin with, and the germs are not so numerous as to overwhelm the defenses at the first onslaught,

the body will of itself in a few days or in a few weeks throw off the disease. Diseases of this type are spoken of as self-limited because their duration is determined by the length of time necessary for the body to form sufficient anti-bodies to overcome the invading bacteria. In such diseases, therefore, the physician seeks to prevent the entrance into the body of more germs, and, on the other hand, to support the heart and other vital organs until the germs already within the body are done away with.

So much for diseases caused by living organisms. When, however, the cause of disease is a chemical poison, such as morphin or arsenic, the antidote furnished by the body is of small moment, unless the poison should happen to be in minute quantity. That is, the body may become immune to some poisons if they are presented in minute quantities at first; and the amount increased very slowly from day to day. Arsenic is such a poison. On the other hand, poisons may be given in such quantities that they cannot be entirely neutralized by the body tissues, but still not enough to produce symptoms of acute poisoning. In such cases the collapse does not occur until the body is nearly saturated with the poison, and serious changes have occurred in the nutrition, the nerves, and other delicate structures. Lead poisoning is a case in point,—where the poisoning is not manifest until paralysis or lead colic occurs.

If mechanical violence is done to any part of the body and a wound made, immediately there rush to the affected part extra supplies of nourishment, and myriads of white corpuscles. The cells lying nearest the injury begin to proliferate and multiply until (unless the wound be too large) the gap is filled with serum and newly born cells. Hence, in cases of such injury, the surgeon's chief duty is to cleanse the wound of all foreign matter (especially bacteria) and seal over the wound and protect it from outside influences while Nature herself repairs the damage

from within. A similar principle is to be followed in cases of injury due to physical causes, such as burns, freezings, etc.,—the part injured is to be protected while it is being repaired from within.

The **first essential**, then, in all treatment is to put the body at rest and protect it from any sort of disturbance that would in any way burden its vital powers. This means rest in bed for the body, bandages for the injured member, and new and peaceful surroundings for the mind. It is axiomatic among physicians that the body cannot do well if the mind is in distress. Therefore, the physician asks for a trained nurse who understands enough about the disease to carry out his orders intelligently and who, above all, knows how to calm and soothe the mind. The nurse must then cultivate for herself a quietness of body and mind—a repose—that will of itself have a good influence with the patient. A nervous nurse is a contradiction of terms. A cynical nurse is an abomination. A selfish nurse, or a slipshod one, is a menace to the community. Such a good nurse, to resume, will see that troublesome and nervous people are kept out of the patient's way; that the sick-room is kept cool and quiet; and in summer that flies and other pests are screened out.

The next duty of the nurse is to present to the patient his food in an appetizing form, and carefully prepared to meet his needs. This means the supporting of the body while it battles with disease. It is rare that food prepared for the general household table will be fit for the sick ones. Hence, the nurse must have had training in cookery for the sick. Taste and tact are as necessary here as in giving the patient rest.

Drugs are given for one of two purposes: either they are to destroy the germ (or neutralize the poison), or they are to support and stimulate the body. Naturally, to be of any use they must be strong enough to have some effect. If they are strong enough to have an effect, then they are too strong to be given with indifference, or by

one unacquainted with their effects. Hence, nurses should avoid offering drugs to their patients, or varying from the physician's directions as to their administration.

There is a growing tendency among medical practitioners, as well as laymen, to use drugs as little as possible and to seek to obtain therapeutic effects by means of natural agents whenever feasible. Thus, to produce perspiration, a physician can use either pilocarpin or a hot pack. Since, however, the hot pack is more easily controlled as to its secondary effects, he usually prefers it. So, also, to reduce fever he may use either aconite or a sponge bath. But, because aconite may weaken the heart, the careful physician prefers to reduce fever by cool sponging. The pain of rheumatism may be relieved by coal-tar products and also by hot-air baths. But coal-tar products injure the heart and blood; therefore, whenever possible, the hot-air cabinet is used.

To move the bowels, we seek to excite peristalsis and also an excretion of fluid into the lumen of the bowel. Some drugs will do this. But the same result may be obtained by abdominal massage, by enemata, or even by giving glycerin suppositories.

Now, all these mechanical means of treatment require time and personal attendance. Therefore, it is seldom that the physician himself can attend to them. It becomes the duty of the competent nurse to do all these things. The physician's work is that of diagnosing the disease and prescribing the treatment. His is more of the mental and hers more of the manual labor in the treatment of the sick.

Of **hot baths** we have the hot tub bath, the vapor bath, the warm douche or spray, the electric light bath, the hot dry-air bath, and the application of heated objects, such as water bags and irons. The *hot tub* bath is used for relaxing tense nerves or relieving excitement and pain. The water should be at 100° F. (measured by a bath thermometer) when the patient is put in, then hot water

Fig. 2.—Extemporized vapor bath with alcohol lamp and gutter pipe.

should be slowly added until the thermometer registers 110° F., where it should be kept for fifteen minutes. The entire body should be covered. It is well to have a cold cloth on the head of weak people when they enter the bath. On being taken from the bath, the patient should be wrapped in a cotton blanket and kept warm and quiet for thirty minutes. Then, she should be sponged off in water at about 70° F., dried thoroughly with considerable rubbing, and put to bed.

The *steam bath* may be given in a cabinet or in bed. If in the former, the instructions accompanying the apparatus should be followed. In bed, the best method is to use a rubber sheet for the patient to lie on. Then, a flannel blanket should be suspended on a frame so that it hangs at least one foot distant from the body in all directions. Such a frame can easily be made by passing rods from the head to the foot of the bed, and tucking in the blanket at top and bottom. A teakettle kept boiling by an alcohol lamp or a Bunsen gas burner should be so placed that the steam from the spout passes through a tube into the space about the patient. An hour of this steaming will usually not be too much. At its close, the patient should be briskly rubbed dry and placed in a dry bed.

The *warm douche* or spray is used in connection with cold sprays for neurasthenia and other conditions demanding the stimulation of the vegetable functions of the body. The spray is given as a single stream (*e. g.*, to the back), as a fan spray, as a needle spray, or as a shower bath. The best equipment provides means for maintaining two constant temperatures and playing them in alternation, according to the needs of the patient.

The *electric light bath* consists of an arrangement of incandescent lamps in a closed cabinet so that the surface of the body is affected both by heat and light rays. It is used for neuritis and skin disorders.

The *hot-air bath* is particularly useful in sprains, kidney

disease and rheumatism. The temperature should reach 300° in most cases. The nurse should keep a cold compress on the patient's head and throat, and should watch the pulse and terminate the bath, if it shows signs of weakness. However, a hot-air bath may be given in bed in the same way that a steam bath is given. It then becomes a part of the home treatment, and such a valuable part that it is incomprehensible why more people do not use it. Each treatment should last for one hour, and the patient should not be exposed to the cold air for at least an hour afterward. If the hot-air bath be followed by a general massage, it is doubly valuable.

To heat some limited part of the body, one can use cloths wrung out of hot water. To avoid scalding the hands, the cloths should be wrung by means of sticks or in a towel. These cloths should be changed every few minutes, or as soon as the cloth becomes cool, the new pack being slipped under the cold one without exposing the patient. Where electric lights are being used, the cloths may be kept hot by hanging over them an incandescent globe of thirty-two candle power arranged with a long conical metal shade (letting the shade rest on the cloth). Such packs must be kept up for at least three-fourths of an hour to be useful. Again, where great heat is not required, the rubber bag filled with hot water is very useful—as in shock, chills, or pain. Where these are not to be had, hot water may be poured into ordinary glass bottles, or stove lids or flat irons wrapped in cloths may be used. In any case, the heated object must not touch the patient's skin. One or two layers of toweling or similar cloth should be interposed.

Cold baths consist in either plunging the patient into a tub of cool water, or rubbing him off with cool water, or in the application of ice bags and cold packs. The cold tub should only be given under the physician's orders and in his presence. The patient is lifted on his sheet and let gently into the tub filled with water at 60°

to 70° Fahrenheit. He can remain for but a moment and needs brisk rubbing afterward. This cold tubbing is a strenuous process and should be used only with robust patients. To sponge a patient, however, one need expose only one part—for instance, one leg—of the patient and keep the rest of the body covered while one sponges off the skin lightly with water at about 50° Fahrenheit. Each part should be dried before being put under cover again. Ice bags are best when made of rubber and with a drainage tube to take off the melting water. Cold packs are used in the same way as the hot ones described above. Cold poultices are made by mixing broken ice and sawdust (to absorb the drip), tied up in oiled silk or muslin and used like an ice bag. The cooling coil is simply the winding of several feet of one-fourth inch rubber tubing into shape so that as much as possible of the surface to be cooled may be covered. One end of the tube is in a pail of water standing higher than the patient, and the other in another pail on the floor. By changing pails, the same water may be used over and over again, if it is kept cool by adding pieces of ice.

Massage, of course, can only be learned under a competent instructor, but the general principles can be stated here. The purpose of massage is to free the tissues from the waste products which a stagnant circulation leaves in them; in other words, to promote the circulation and to exercise the muscles. The stagnation of circulation is very common in our days of sedentary life. Therefore, massage frequently accomplishes brilliant results when given under the prescription of a physician who knows what should be done. Because of its brilliant results when properly applied, charlatans and ignoramuses have exploited massage, seeking to erect it into a system of medicine and to endow it with some mysterious power. Like all effective agencies in the treatment of the sick, it is safe only when applied by one whose knowledge of the constitution of the human body, of pathology and of

the sciences, is adequate to individualize the treatment for each patient.

In general, all movements in massage should be toward the heart. The various movements are: stroking, friction, kneading, vibration, percussion, and joint movements. Stroking is a gentle sedative movement with the fingers or palms. Friction is a heavy stroking, using the balls of the thumb and fingers. The first relieves nervousness, the second is good for edema and stagnant lymphatic circulation. Kneading is an alternate compression and lifting of the tissues—not letting the hand slide over the surface as in the preceding movements, but remaining in one place. Vibration is done with the finger tips, or with electrically driven machines. It and the kneading are very stimulant procedures for those who need a stirring up of the metabolic processes. Joint movements may be either passive or resistant. They belong to the final stages for the treatment of arthritic troubles. For constipation due to sluggishness, the kneading and friction of the abdomen along the course of the colon—beginning near the right hip in the right iliac fossa, passing upward toward the ribs, across to the left side and then down to the pelvis—is quite effective. Sometimes the rolling of a six pound cannon ball about the abdomen is also fairly effective as a substitute for the manual treatment.

Enemata.—The injection into the rectum of medicated water is used for cleansing the lower bowel and for stimulating peristalsis. Another form is the nutrient enema—to supply food to those whose stomachs cannot be used. In view of the fact that the use of enemata is sometimes exploited as a harmless but sure cure for constipation, we must take this occasion to state that it is subject to the same laws as every other procedure and cannot fit all cases. It can also harm the bowel. It should, therefore, be used under a physician's directions. Enemata, to be effective, should be given with the patient lying on the left side. If possible, the hips should be higher than the

shoulders. Unless the physician prescribes a colon tube, a small nozzle (the smallest of a fountain syringe set), smooth with vaselin, should be used. If glycerin be added, the proportion should be from one in eight to one in four parts. If soap be used, a non-irritating variety (such as castile or Ivory) should be selected. It should be shaved into the water until a strong suds be made. A neutral enema can be made with a teaspoonful of table salt to the pint of water. Double the quantity of salt and the effect is astringent on the lining membrane of the bowel. Olive oil enemata are sometimes prescribed. In using them the hips must be greatly elevated and the oil kept warmed — for the flow is slow at best. The oil can be used in an ordinary fountain syringe, if desired.

Nutrient enemata are made with milk and eggs which have been predigested with pancreatin and soda. Before injecting such an enema, the rectum should be cleaned with an enema of normal salt solution (one teaspoonful of salt to the pint of water). Then, the nutrient enema should be put in very gently and at blood heat. The patient should be kept as quiet as possible, to prevent his ejection of the food.

Vaginal douches hardly come under the head of enemata, but should be spoken of in passing. They also are more effective if given with the patient lying down. Here, a large blunt nozzle with side holes should be chosen. It should be inserted about two or three inches and moved about during the flow. The water should be warmed. The medication should be directed by the physician—*e. g.*, one-half of one per cent. solution of lysol for pus cases, or normal salt solution for simple cleansing. Many women overdo vaginal douching, and the majority give it too hastily or in the wrong posture to be effective.

Catheterization should not be done by any one who has not had special training. We speak of it here only to call attention to its dangers and prophylaxis. Because of the danger of infecting the bladder, every catheter

should be boiled before using, and then should be handled only by some one with very clean hands. The vulva in the female or the penis in the male should be thoroughly washed off with an antiseptic solution before the catheter is inserted. Such an antiseptic solution is one-half of one per cent. solution of lysol.

Poultices are not used as much as formerly, because they were frequently used to kill time until a diagnosis could be made. They relieve and hasten suppuration because they induce a hyperemia. Ordinarily, all their good effects can be obtained by a hot water bag or other heat-giving object. However, if a poultice is to be used, the cleanest kind is the best; and we recommend the recently introduced clay poultices. These are clean, perfumed, and just as effective as a dirty linseed or onion poultice. Poultices should, of course, be applied warm and kept covered. They should be changed as soon as they become dry. When taken off, the part should be protected by a bandage to prevent chilling.

Hyperemia may also be produced by vacuum apparatus, such as the dry cups or the bulbs used by Professor Bier. These are effective in treating boils, abscesses, and even neuralgias. For ordinary boils five minute treatments two or three times a day with a small glass cup attached to a bulb will be grateful. The air should be exhausted until the boil bulges up into the cup in a cone.

We can stimulate the kidneys by giving digitalis by the mouth. But, since digitalis upsets the stomach, we prefer to inject it, or some other drug, under the skin and thus avoid the stomach altogether. This latter method of **hypodermic medication** has also the advantage of taking effect more rapidly than oral medication, and is therefore prized on that account. Then, too, when we give drugs by the stomach, we can never tell how much is absorbed by the blood and how much is lost by passing off with the feces. Hypodermic medication, on the other hand, is

reasonably exact in its dosage and its ease of control makes it also preferable.

In this country, medicines intended for hypodermic injection are prepared in the form of very soluble tablets. Great care must be exercised by the manufacturers to free these tablets from all irritating substances. Hence, one should never try to use ordinary tablets hypodermically. The best sort of syringe is the all glass one, because it can be boiled and thoroughly sterilized. Before using, it is well to draw grain alcohol up into the syringe a few times. This is both antiseptic and cleansing; but care must be taken to see that all the alcohol is expelled and the syringe rinsed in sterile water before drawing up the medicine. The next step is to draw the syringe full of water (distilled, if possible) which is still hot from boiling. This is then ejected into a clean teaspoon and the tablet dropped into it. Solution is hastened by stirring. As soon as a solution is complete, the medicine is drawn into the syringe again. Then, a place on the arm or chest where the skin is loose is cleansed with alcohol, pinched up between the thumb and forefinger of the left hand, and the needle inserted quickly and deftly into the fold parallel with the surface of the body until the point is clear below the skin. The plunger should then be slowly but steadily pushed down, in most cases being accompanied by a slow withdrawal of the needle. As soon as the medicine is all under the skin, the needle is pulled out very quickly and the clean finger-point placed over the puncture. A gentle massage will help disseminate the medicine. A clean cloth should be laid over the puncture until it is sealed, which ordinarily occurs in an hour or two. The syringe should be cleaned by rinsing in water and then in alcohol. The special advantage of alcohol is that it keeps the steel parts from rusting. The usual American syringe contains about one cubic centimeter. Where possible, the two cubic centimeter all glass syringe should be at hand, because of its greater capacity as well as its

cleanliness. One can see the effect of hypodermic medication in from five to fifteen minutes, where it would take twice as long for oral medication to become effective.

CHAPTER III.

MEANS FOR DETERMINING THE CONDITION OF PATIENTS.

Because no two people think alike or respond alike to external stimuli (such as pain or discomfort), it is necessary for us to have other means for judging their condition than those derived from a statement of their feelings. In other words, we must have objective symptoms to supplement their relation of subjective symptoms. Those symptoms which can be observed by the attendants are the following:

Temperature.*—The normal temperature of the human body averages about 98.5° Fahrenheit (36.5° to 37° Centigrade). It is higher in the infant (99° to 100° Fahrenheit) than in the aged and feeble. It is also usually somewhat higher between four and eight o'clock in the afternoon than at any other time. The lowest point in the diurnal variation is usually reached between midnight and morning. A collapse temperature ranges about 95° Fahrenheit; 97.5° is called subnormal; 99.5° to 101.5° is called sub febrile; 102° to 103° is a moderate febrile; 104° to 105° is a high febrile; and one of 106° degrees is called hyperpyrexia.

The essential symptom in fever is an elevation of

* To change Fahrenheit to Centigrade calculations, subtract 32 and divide by 9, then multiply by 5. To change Centigrade to Fahrenheit, divide by 5, multiply by 9, then add 32.

temperature; therefore, we often say that a person has a fever when we simply mean that his temperature is higher than normal. Fevers, as such, are grouped according to the range of temperature: thus a patient whose temperature in the morning is normal, but whose evening temperature rises to, say, 99.5° or above, is said to have a "remittent" fever. Again, if the temperature rises above normal on alternate days, or every third day, then we call it an "intermittent" fever. A "continued" fever is one wherein the temperature remains steadily above normal during the course of the disease, showing only the diurnal variation. Tuberculosis affords a type of the "remittent" (or "hectic") fever; malaria is the typically "intermittent" fever; and pneumonia and typhoid afford us two examples of "continued" fever. In "continued" fever, the beginning (or while the curve is still rising) is called the invasion; the maximum is called the fastigium; and the gradual fall is called the decline. When a fever ends with a sudden fall in the temperature, it is said to end by "crisis"; when the fall is gradual, by "lysis."

The temperature is measured by a specially made thermometer called the "clinical" thermometer, which shows only the degrees between 95 and 107 in those arranged for the Fahrenheit scale; and 34 to 43 on the Centigrade scale. This thermometer has such a large bulb of mercury and such a small bore that an exposure of one to two minutes is sufficient. Before being used the mercury should be thrown down to 95° by holding the top of the thermometer between the thumb and finger and giving it a whole arm swing (without jarring it), depending upon centrifugal force to carry the mercury toward the lower end. After being thus used, the thermometer should be cleansed and disinfected. It can be rinsed off in cold water (never in any warm solution), to which antiseptics have been added. Our custom is, however, to use alcohol (50 per cent. to 95 per cent. solution) into which

the thermometer is dipped for a few minutes and then wiped dry.

The temperature is taken in the mouth, in the axilla, in the groin, or in the rectum. The mouth is the oftenest used. In order to avoid the influence of the cold air breathed through the mouth, the thermometer should be kept under the tongue and the lips closed. When coming in from the cold outdoor air the temperature of the mouth would be affected, of course, by the cold air, and we should not take the temperature by the mouth for fifteen minutes afterward. Again, hot or cold food and drinks affect the temperature of the mouth; and we should not take the temperature immediately after their use. Under the arm, or in the groin, the temperature is about one degree lower than in the mouth; therefore, when stating axillary temperature, one should always tell where it was taken. In taking the temperature in the axilla, the mercury bulb should be pushed up as far as it will go into the arm-pit, the thermometer lying parallel with the axis of the body and the arm being then placed against the body. This method is useful with mouth breathers and irresponsible patients, such as infants and the delirious. Rectal temperature is slightly higher than the oral (that taken by the mouth). To obtain it, the bulb is oiled or covered with vaselin and inserted one to one and a half inches into the anal canal, after the latter has been cleansed with a small enema. This method is especially useful with babies. In all cases, the thermometer should not be removed within one minute (better, however, two minutes).

The body can easily survive a temperature of 106° maintained for a short time; but a temperature of 105°, or higher, maintained for forty-eight hours or more is of itself a menace to life. That is, the high temperature destroys tissue more rapidly than it can be replaced. In other words, in ordinary fever temperatures it is the underlying pathologic process that endangers life rather

than the abnormal temperature. Hence, ordinary fever temperatures may be left untreated and the whole attention given the disease. Children endure high temperatures better than the aged. Thus, 103° in a person over fifty years of age is always serious, even if the pathologic process be rather trivial.

Pulse.—The pulse is noted usually over the radial artery in the wrist, just lateral to the strong cords which stand out so prominently on the front of the wrist. The pulsations should be counted for at least one-half minute, with one's eyes fixed on the second hand of a watch. The rate is always reckoned by the minute; thus, if one counts forty pulsations in the half minute the rate is eighty. One should use the finger tips (not the thumb) in counting and should note whether the pulsations are quiet and soft, or hard and beady.

One can also feel the pulse over the temporal artery on the head; over the facial, just in front of the angle of the jaw, and over the carotid in the neck. The pulse can also be felt in the leg—the most useful places being in the groin and just above the heel between the ankle and the tendon of Achilles.

In fever the pulse rate increases about eight beats (seventy-two being understood as normal) for every degree of temperature: thus, at 102° one expects a pulse rate of 100 or above. Typhoid fever is an exception to this rule, and a high temperature with a slow pulse should make one suspect the presence of this disease. Pressure on the brain center, as in apoplexy or fracture of the skull, also produces a slow pulse, so does also severe icterus (jaundice). An irregular pulse is typical of heart disease; or, at least, of failing strength.

The attending physician should be informed of irregularity or peculiarity of the pulse wave. Normally, we have a single strong, but soft impulse. In certain diseases this becomes doubled or irregular or hard and small or so soft that one can hardly feel it.

The normal newborn babe has, however, a pulse rate of 120–140 with a single stroke, which gives one the impression of a double pulse beat. This rate gradually decreases, until at the end of two years we find a rate but little above the adult normal and with the normal impulse.

Respiration.—Difficulty in breathing may be due, first, to an obstruction in the throat (the trachea or larynx); second, to some condition of the lungs which prevents the free flow of either air or blood through them; third, to weakness of the heart so that the blood is not sent to the lungs regularly; or, fourth, to nervousness. The condition, from whichever cause due, is called dyspnea. The character of the respiration is therefore an important fact in determining the condition of the patient. The number of respirations in a minute should be noted and recorded in all serious illnesses—the normal rate for an adult being fourteen a minute and for a child up to thirty. Not only the rate but the depth or shallowness of each breath should also be observed. Moreover, the nurse should note whether the obstruction seems to be in the inspiration or in the expiration; in the throat or in the chest; and whether the breathing is carried on only with the help of the external muscles of the chest and neck—that is, if the cords and veins of the neck stand out with each breath. This last, of course, is a characteristic of severe dyspnea. Notes on all these points are desired by the physician when he requests the nurse to "watch the breathing."

Dyspnea due to an obstruction (obstructive dyspnea) is found in croup (in the larynx or trachea), in bronchitis (in the bronchial tubes), and when foreign substances lodge in the air-passages. The second sort of dyspnea (pulmonary dyspnea) is quite characteristic of advanced consumption. The third variety (cardiac dyspnea) occurs in heart and kidney diseases. The fourth (nervous dyspnea) may be found in hysteria, where it sometimes

even reaches the point of unconsciousness—or "fainting." A peculiar dyspnea usually indicative of approaching death is the Cheyne-Stokes type of respiration. Here there is a long deep breath followed by a series of rapid, gradually shortened ones; then, a pause; then, the long breath again. This is found in cardiac failure and in injuries to the respiratory center in the brain. Shallow breathing is seen in tightly laced women, in cases of abdominal tumors, and in extreme weakness.

Appearance of the Skin.—The normal color of the skin is due to the even distribution of the blood through it; therefore, pallor indicates a smaller, and redness a greater, amount of blood present in that particular part. Cyanosis is due to the engorgement of the skin with venous or unoxygenized blood; for instance, in an ambulant adult patient it usually means severe emphysema (dilatation of the air-vesicles in the lungs); in the child, it means congenital defects in the valves of the heart. A general waxiness of the skin is found in chlorosis, where the blood itself is abnormal. A lemon yellow is found in pernicious anemia. Yellowish brown patches are caused by pregnancy and uterine disorders. A yellowish green is characteristic of jaundice. The influences causing changes in the color of the skin are sometimes more clearly seen in the mucous membranes and the conjunctivæ. Thus, jaundice shows early in the whites of the eyes, and anemias in the mucous membranes covering the gums.

A dryness of the skin shows that the glands are inactive; which may be due to a constriction of the blood-vessels, either because of local influences, such as cold or pressure, or to the influence of the nerves, as in fear, shock, etc. In fever we find the skin very dry and hot (showing how greatly the nervous mechanism of the body is affected by the disease), and then a profuse perspiration coincident with the falling temperature. A dry skin (anhidrosis) is also found in dysentery or other

disorders where there is a profuse discharge of fluid by way of the bowels or kidneys. It also appears in diabetes, chronic interstitial nephritis, carcinoma, and similar diseases. Sweating of the hands or feet (hyperhidrosis) is usually of nervous origin or due to personal peculiarities. Night sweats are found also in pulmonary tuberculosis. Sweating of the head occurs in rickets. Neuralgias and migraines also produce localized perspiration. When the skin is blanched, the inner organs are usually suffused with blood; and vice versa.

A distinct bronzing of the skin occurs in the disease of the adrenal bodies (the small ductless glands lying near the kidneys in the abdomen) called Addison's disease, and a similar appearance of the skin is caused by the long-continued ingestion of silver (argyria) and arsenic (arsenical melanosis).

The condition of the skin should, therefore, be carefully observed when one is caring for the sick or is reporting the condition of the patient to the medical attendant.

Excretions.—The character of the various excretions shows how well the group of organs involved in the production of such excretions are doing their work. Careful observation is, therefore, necessary even if repugnant to the general mind. Inasmuch as the used-up tissue of the body is excreted chiefly through the kidneys, the *urine* gives great light on metabolic processes. The total quantity passed in twenty-four hours is always important, and in all severe diseases the nurse should keep a record of the amount passed at each urination and all the urine passed in a definite twenty-four hours should be kept cool, and mixed when sending a sample for examination. The odor, color, and sediment (kind and amount) should be noted; and about four ounces of the mixed urine poured into a clean bottle and kept in a cold place for the physician to examine.

The normal amount passed in twenty-four hours varies between 500 and 2000 c.c. The quantity is physiologic-

ally less when the patient perspires freely (after exercise or hot baths or in warm weather) or in severe diarrheas, or where the fluid intake is restricted. Abnormally scanty urine (oliguria) occurs in acute and chronic parenchymatous nephritis, and in passive congestions due to a weakness of the circulation. An increase in the amount of urine (polyuria) occurs normally in nervous excitement, increased ingestion of fluids, and in suppression of perspiration; *e. g.*, in cold weather. It is a symptom of the disease in diabetes, chorea, pyelitis, and various nephritides.

Increased frequency of urination suggests some irritation of the urinary passages or bladder. Thus, in old men we find this symptom in prostatitis. Gonorrhea usually produces a painful urination with increased frequency. Suppression of the urine occurs in acute nephritis, and in the new born in congenital defects of the kidneys. Retention of the urine in the bladder occurs in paralysis of the bladder, inflammation of the urethra, and in obstruction, as by pressure from an enlarged prostate gland.

The ingestion of carbolic acid, salicylic acid, and other coal-tar products renders the urine greenish black. The destruction of the hemoglobin by some malignant disease renders the urine a port-wine color. Methylene blue makes the urine green. In ileus (obstruction of the bowel), cholera, and typhus, the urine may be blue. Rhubarb, senna, and chrysophanic acid (chrysarobin) produce an orange or reddish brown urine. Santonin makes it yellow. A brick-red sediment speaks for concentration and the increased formation of urea.

Turpentine produces an odor of violets in the urine. Ammonia produces its peculiar odor in the urine. Nitrobenzol poisoning gives the odor of bitter almonds.

A high specific gravity denotes concentration, but also demands a test for the presence of sugar. Fermentation of the urine renders it very light. Thus, a sugar-containing urine might have a specific gravity of even less

than 1.000 if fermentation were allowed to proceed long enough to form plenty of alcohol.

The *feces* give valuable evidence of the presence of parasites or gall-stones. To examine them for this purpose the stool should be poured into a coarse-meshed sieve, and then have water poured over it until everything soluble has passed through the sieve. In general, however, the color, odor, and consistency of the stool should be noted. Thus, the black stool may indicate hemorrhage or merely the presence of sulfates or bismuth; the clay-colored stool shows a lack of bile or the lack of the digestion of the fats; the mucus-covered stool shows the presence of inflammation or of abnormal nervous influences, etc. For the examination of the feces for parasites, such as hook worms, trichomonads, seat worms, etc., the stool should be kept warm by setting the vessel in warm water until it reaches the laboratory.

Sputum.—The sputum affords a means for ascertaining the active cause of diseases of the respiratory tract. Samples should be obtained by telling the patient to expectorate into a clean wide-mouthed bottle, after the mouth has been thoroughly cleansed with a brush and by gargling. In general, this should be done on rising in the morning. It is helpful to know the color and general appearance of sputum; whether it is frothy, if it floats on water, and its odor. No antiseptic should be in the cup into which the patient expectorates when it is desired to examine the sputum for the presence of tubercle bacilli. Sputum that separates into three layers is characteristic of bronchiectasis.

The **stomach contents** must often be examined by the physician to ascertain the condition of gastric digestion. For this, a test-meal is given consisting of known kinds and amounts of food, and the stomach contents are withdrawn after a definite time. Thus, to ascertain the character of the gastric juices the Boas test-meal, consisting of one tablespoonful of oatmeal in a quart of

Fig. 3.—Gastric lavage. Position and work of the nurse.

water boiled down to a pint, is used. The stomach contents are withdrawn one hour later. The Ewald test breakfast used for the same purpose consists of one or two slices of stale bread or of one or two baker's rolls, with 300 to 400 c.c. of weak tea (two small cups) or water. This is also withdrawn after one hour. To test the motility and patency of the stomach the test dinner of von Leube and Riegel is used. This consists of 400 c.c. of soup (four-fifths of a pint); 50 grams (two ordinary slices) of wheat bread; 100 to 200 grams (one-fifth to two-fifths of a pound) of finely chopped beefsteak; and 200 c.c. (ordinary glass) of water. It is withdrawn after four hours.

To withdraw the stomach contents the nurse should thoroughly cleanse the stomach tube and lay it in a basin of cold and clean water until the operator takes it up for use. She should have at hand a pitcher with a measured quantity of sterile (better, distilled) water. For a diagnostic stomach washing probably 1000 c.c. of such water would be sufficient, but for therapeutic cleansings three or four times that amount will be necessary. Two basins should be provided: one for the patient to hold in his lap to receive any overflow that may come out outside of the tube, and another for the operator to receive his specimen in. It is better if this latter basin be a glass vessel. The patient should have a rubber sheet fastened at the neck and covering him to his feet. Plenty of small towels should be at hand. The work should be done in a room with a bare floor that will not be spoiled by wetting. The nurse should stand at the patient's left hand and be ready to pour water into the tube, or hold the tube, or do whatever the moment may demand.

The operator takes the moist tube, stands at the patient's right with his left arm about the patient's head, and inserts the tube with his right hand. He pushes the end back toward the throat of the patient and asks the latter to swallow. The tube should then be

gently pushed down until the end is about twenty-five cm. beyond the patient's front teeth. The patient presses as if at stool, and this usually brings up the contents of the stomach through the tube. When this is not effective a measured quantity of water is poured in and withdrawn by siphon action, when the operator lowers his end of the tube to below the level of the patient's stomach. This is repeated until the desired quantity is obtained, when the tube is quickly withdrawn and washed out.

The **blood** needs to be examined in most severe diseases and always before a major surgical operation. This is the work of a pathologist and the nurse has only to cleanse the ear or the finger thoroughly with alcohol and ether where the puncture is to be made. When the number of white corpuscles exceeds 10,000 per cubic millimeter, we speak of a leukocytosis; when it is below 5000, of a leukopenia. The former occurs, for example, in pneumonia; the latter in typhoid fever. When the hemoglobin is below 90 per cent. and the number of red corpuscles under 4,500,000 per cubic millimeter we have an anemia. (See Chapter XXIV.)

CHAPTER IV.

TYPHOID FEVER AND TYPHUS FEVER.

Typhoid Fever.

Typhoid fever, called by the English enteric fever and by the Germans typhus abdominalis, was differentiated from typhus fever (that dreaded scourge prevalent until seventy-five years ago aboard ships and in the subtropical climates) only as late as 1840 to 1850. It is now recog-

nized as a disease of practically universal extent; and, although especially prevalent during the springtime and autumn, it is never entirely absent at any season of the year.

Etiology.—This disease is caused by a bacillus which moves about by means of flagella arranged along its sides. This bacillus lives for a long time in water or milk. Hence, these two substances are frequently vehicles of contagion. This disease is essentially an inflammation of the mucous membrane lining the lower intestine, more especially of the ileum. The particular tissue attacked is the lymphoid tissue of the agminated follicles (or Peyer's patches), which are masses of glandular tissue scattered along this part of the bowel. Under the influence of the bacillus these follicles swell up into great red tumors which look like swollen tonsils, though on a smaller scale, and the tops of the tumors finally slough off, leaving deep bleeding ulcers with undermined edges. In the normal course of the disease in a few days these ulcers are covered over by "scabs" or scar tissue, which after a time is replaced by solid membrane and the bowel returns to its normal condition. The prostration and utter weakness of the patient, characteristic of this disease, are caused by the absorption into the patient's blood of excretions (called toxins) from the bodies of the bacilli. These poisons affect the nerve-centers of the brain and spinal cord and therefore reduce to its lowest point the patient's vitality. The dangers of the disease

Fig. 4.—The typhoid bacillus (Dr. W. K. Trimble).

are therefore: First, hemorrhage from the ulcers. Since, in the sloughing process one or several small arteries may be broken into, the patient may lose so much blood as to reduce him below the rallying point. Second, the thin wall of the intestine at the bottom of the ulcer may be broken through either by increased movement of the intestines—*i. e.*, abnormal peristalsis—or by hard substances, such as scybala in the intestines, or by an exaggeration of the sloughing process. This perforation allows the contents of the intestine to escape and to enter the peritoneal cavity, whence they are absorbed by the blood into the general circulation with a rapidly fatal result. Third, the quantity of toxins absorbed by the blood may be so great that the organism cannot form rapidly enough the necessary antitoxins to neutralize them and therefore perishes (for the body forms its own best medicine)—this condition is called toxemia. Fourth, the bodies of the bacilli themselves frequently penetrate the blood-vessels and are carried to the various organs in the body and there produce secondary inflammation—such as in the meninges of the brain, the gall-bladder, and the joints. These secondary inflammations are generally sufficient by exhausting the patient to deprive him of what little vitality he has left, and he perishes.

Normally, typhoid fever is a self-limited disease, because the normal body is able to form antitoxins in two or three weeks which gradually neutralize the toxins exuded by the bacilli, and since the antitoxins infiltrate the whole body, they make the tissues of the body uninhabitable for the bacilli. Therefore, if the ordinary patient can be supported and protected from accidents, he has a good chance of surviving the disease. The duration of the disease is usually four weeks, but it may be shorter or longer. The period which elapses between the first receipt of the infection into the body and its breaking out (that is, the incubation period) varies from eight to twenty-three days, averaging fourteen days.

The mortality of the disease is usually estimated at ten per cent.; but, in the mortality statistics of most states, it will be found to be much higher, probably because physicians are careless about reporting any but the most severe cases. But the fact that one in every ten attacked dies indicates the necessity of paying close attention to its treatment and dissemination. When the disease is fatal, it is so because the patient is not in good condition to resist such an attack when the disease begins, or is not properly supported during the attack.

Symptoms.—The disease begins with very indefinite symptoms,—general malaise, headache, lack of appetite,—which increase from day to day until one finds vomiting, slight fever, constipation or diarrhea, and general weakness. The fever rises gradually from day to day for about a week, being higher each evening than in the morning and reaching, at its maximum, 104° to 106° F. It remains for about a week at its maximum with only diurnal variations, then shows a gradual decline, each morning being lower than the preceding evening, so that one has in this descent the picture of a stairway when one plots it out on a chart.

The pulse ranges lower than the temperature would indicate, rarely going above 120 and usually below 100. This is one of the chief characteristics of the disease; and when one finds a temperature of 103° and 104° with a pulse of only 80 or 90, one has reason to suspect typhoid fever. Another characteristic is a double impulse of the pulse wave. Instead of feeling a single impulse as in the healthy person, we feel a strong, followed by a weaker, stroke (dicrotism).

The disturbed condition of the bowel is shown by an alternation of diarrhea and constipation. The stool becomes watery and has a pea-soup appearance. The odor also becomes unnatural, having a peculiar fetid character. These symptoms are affected by the diet and treatment; and, therefore, vary greatly.

On about the sixth or seventh day, there appear eruptions on the trunk, especially over the abdomen. Their color has caused them to be called "rose spots." They vary from one-eighth to one-sixteenth of an inch in diameter and their color disappears on pressure, *i. e.*, if one apply a piece of glass to the suspected spot, one notices that the spot appears blanched through the glass.

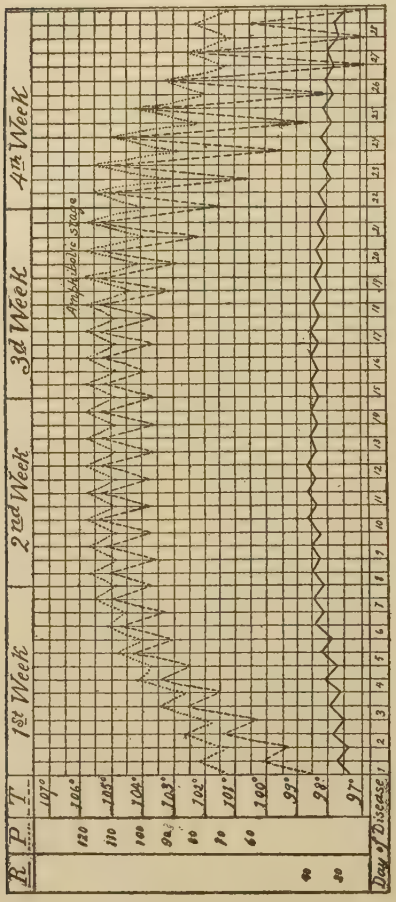

Fig. 5.—Temperature, pulse, and respiration curve in typhoid fever (schematic) (Sahli).

Still another symptom is the twitching of the tendons—especially in the wrists. This is irregular and asymmetric and is thereby distinguished from the twitching of nervous disease, where the twitching is rhythmical and more or less symmetric.

The blood shows a leukopenia (relatively small number of white corpuscles) and gives the Widal reaction after four or five days. This reaction is

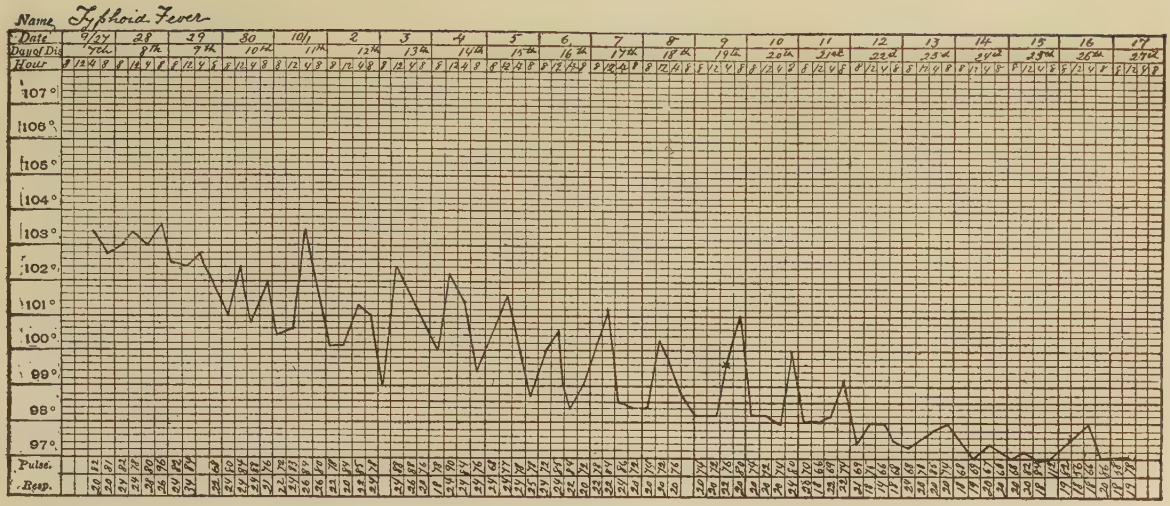

Fig. 6.—Typhoid fever temperature chart. This is the chart of an actual case and is inserted to show the frequent effect of good care and treatment on the course of the disease. (The patient was first seen on the seventh day.)

the clumping and rendering inactive of a colony of typhoid bacilli by mixing it with a little of the patient's blood. This is, of course, due to the development in the patient's blood of those "anti-bodies" which ultimately overcome the bacilli active in the system.

Typhoid fever is more apt to appear in youth, owing to the fact that the adenoid (or lymphoid) tissue wherein the infection has its seat, is more plentiful than later in life: but no age is exempt from the disease. On account of the general weakness of the latter, aged patients are more apt to succumb. Because of the development of the "anti-bodies" during the disease, people do not ordinarily have the disease twice; but this immunity wears off with time and people who have had the disease should not put too much trust in an acquired immunity.

Treatment.—As soon as the physician pronounces a patient ill with typhoid fever, the family has two duties to perform: First, to see that the patient rests free from all exertion; second, to protect other people from the disease. Because the disease generally kills by exhausting the vitality of the patient, we need to give the patient as much nourishment as is consistent with his impaired digestion and diseased organs, and we must keep him flat on his back so that he will not use up one ounce of strength more than is absolutely necessary.

The diet consists of milk and fruit juices. Some patients cannot take even milk; but most of them can take the milk if it is predigested. The nurse should watch the stool carefully, and if curds of milk and other undigested food particles occur therein, the physician should be notified in order that he may change the diet. To predigest the food, we secure tubes of powdered pancreatin * and soda and stir the powder into warmed milk—then put the mixture on ice until needed. Of the fruit juices, unfermented grape juice is the most used.

*One would better purchase these tubes ready prepared and secure a reliable article, such as Fairchild's or Wyeth's.

In any case, whatever the food the patient should never be allowed to overload his stomach. It is better to give a glass of milk sipped slowly, or fruit juice, every two or three hours than larger quantities less frequently.

The patient should not be allowed to rise in bed or stir unnecessarily. He should not even rise for urination or defecation. Convenient and comfortable bed pans and urinals should be at hand for such purpose.

There is danger of communicating the disease by handling the patient or his clothing; therefore those who care for the patient should be careful to rinse their hands in a solution of one part of bichlorid of mercury to one thousand parts of water; and change their garments whenever they go off duty. The clothing from the patient and the bed should be soaked in a five per cent. solution of crude carbolic acid before it is sent to the laundry or mixed with other clothing. In general such clothing should always be boiled and not cleansed by any of the cool washing processes. In view of these facts it is wise to have both of the above-named disinfectants at hand during such a disease as typhoid. The bichlorid of mercury should be purchased in tablets of the size necessary to dissolve in one pint of water. The crude carbolic acid is cheaper than the refined; and for this purpose is more effective.

The chief means of contagion is, however, through the patient's excretions. It is not sufficient to bury the dejecta; still less is it to throw urine and feces into the garden. Milk of lime or crude carbolic acid (five per cent.) should be poured over and cover the excreta and be allowed to stand for at least one-half hour before the latter are disposed of. After disinfection, the stool should be buried or thrown into the privy vault, but never over the garden or over growing vegetables. This latter method has proven a source of contagion.

When the patient is free from fever his appetite is ravenous, but it should not be indulged. The rule of

small meals frequently repeated, which prevailed during the fever, still holds good. No food should be given not specifically authorized by the doctor. Steak specially broiled and oven-dried toast are generally permitted on the third day after the fever leaves. This is the first solid food. The amount and variety are then gradually increased.

Emergencies in Typhoid Fever.—There are, of course, many accidents and emergencies which the nurse must meet, because they must be met before the doctor can reach the bedside. Of these the most common is abdominal pain. This is usually caused by the accumulation of gas in the bowels and varies in location and character from moment to moment. The best treatment for such a condition, in general, is the application of the hot-water bag, or cloths wrung out in hot water. Heat in a fever is not desirable, however; therefore in typhoid fever the best results are obtained by causing the gas to pass off through the rectum by means of warm water enemata or by the insertion of a colon tube. This latter procedure should not be undertaken by an inexperienced attendant unless under the eye of a doctor or a trained nurse. This pain should not be present if the diet and treatment are correct.

The most dreaded emergency is the perforation of the bowel with the consequent onset of peritonitis. The signs of such a calamity are usually a sudden, severe fall in body temperature, usually until it is below normal; an increase in the pulse rate; the appearance of clammy perspiration on the forehead; and a pinched expression on the face. The physician denotes the condition as one of collapse. If the nurse see such symptoms along in the second, third, or fourth week of the disease, she should at once call the physician. Before his arrival, she can help matters by applying cold to the abdomen either in the form of an ice-bag or cloths wrung out in cold water and changed frequently and by keeping the patient par-

ticularly still. The only effective treatment for this usually fatal mishap is surgical interference. When the nurse detects the perforation almost as soon as it occurs and an operation is immediately performed, the patient has a better hope of recovery than otherwise.

More common than the perforation is the intestinal hemorrhage. This, if unrelieved, will also prove fatal. Hemorrhage is usually detected by the nurse because she finds blood in the stools. Hemorrhage may also cause a fall in the body temperature, an increase in pulse rate, and some distention of the abdomen. Here, again, the physician must be notified. Before his arrival the nurse may help matters by applying ice to the abdomen; and if necessary giving the patient tincture of opium in a fifteen-drop dose, every two hours. The patient must be kept quiet. It is usually advisable to raise the foot of the bed from four to six inches.

The delirium of typhoid fever is more alarming than dangerous. It is nearly always present at some time during the disease and may leave some illusions or hallucinations persisting even into convalescence. Rarely does the patient create a disturbance; therefore the chief work of the nurse is to soothe the patient by gentle assurance that everything is well. Sometimes, however, the application of cold to the head will assist greatly. This is best accomplished by an ice-bag or head coil. Of ice-bags, the best are those which have an outlet and tube to drain off the excess water. This keeps the temperature of the surface lower than when water is allowed to accumulate in the bag. The ice coil is simply a piece of one-fourth inch tubing, coiled to fit over part of the head. A bucket of ice water is placed by the bedside two or three feet higher than the patient's head and the water is passed through the tube into another bucket on the floor by the side of the bed by means of siphon action.

Typhus Fever.

Typhus fever (spotted fever, ship fever, jail fever), with which until in the last century typhoid fever was confused, is a disease of famine and starvation; and used to appear in Ireland during famine times; and in prisons and on shipboard during the old *régime*. It is extremely rare now.

The disease is very contagious and nurses must adopt every precaution to prevent infection. In particular, they should keep the air of the room very pure and fresh, and promptly and frequently disinfect the bed clothes and utensils employed about the patient.

The disease has a course of some fourteen days and terminates by crisis. The incubation period lasts about twelve days. The onset is sudden and attended with chills and fever, and sharp pains in the head and back. The pulse is full and bounding. The tongue is coated. Vomiting is frequent.

After three or four days an eruption over the abdomen, chest, and then face and extremities, appears. The rash is hemorrhagic in character and only the lighter spots disappear on pressure. At first the rash looks like that of measles, but later assumes the peculiar appearance and feel due to its petechial character. The patient is utterly prostrated and lies flat on his back, "with dull, expressionless face, flushed cheeks, injected conjunctivæ, and contracted pupils" (Osler). The second week finds the symptoms more pronounced than the first and delirium is usually present.

The fever course reaches its highest point (105° to 107° F.) about the fifth day and then runs with only the diurnal variations until the crisis on the twelfth to fourteenth day.

Death usually occurs at the end of the second week and is due to exhaustion (and is preceded by a sharp rise in temperature to 108° to 109° F.) except in those rapidly fatal cases (*typhus siderans*) where the end comes after

two or three days. Sometimes the patient may live until the third week and then be carried off by a pneumonia. The mortality is light in children, but reaches 50 per cent. among adults.

There seems to be no particular localization of the disease in the body and the general degeneration in the vital organs is that characteristic of a severe and exhausting toxemia rather than that due to localized processes.

The treatment is similar to that of typhoid—especially, the cool sponging, the dieting, and the stimulation.

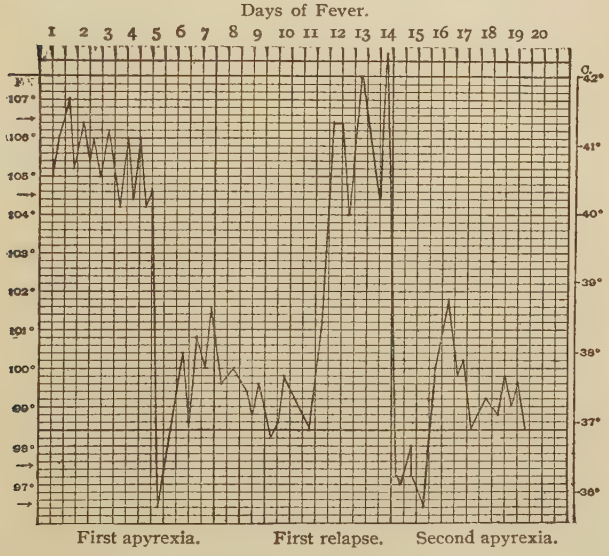

Fig. 7.—Temperature of recurrent fever (Wunderlich).

Relapsing Fever.

A similar condition to typhus is the relapsing fever now appearing in the Philippines and which was seen for the last time in the United States in New York and Philadelphia in 1869.

The incubation period may be as long as seven days. The onset is characterized by chills, fever, and intense pain in the back and legs. The fever is high and the pulse rapid. Delirium appears promptly. The spleen is usually swollen and jaundice may appear, but intestinal symptoms are rare. The patient may be troubled with a cough and herpetic eruptions may appear. After five or six days, the fever suddenly falls, accompanied usually with a profuse perspiration and a diarrhea.

Then, for a week to ten days the patient enjoys normal temperature and is just beginning to get around again when the relapse occurs. This is ushered in with a chill and repeats the symptoms of the former fever. A second crisis appears on the twentieth to twenty-third day of the disease, after which the patient may rapidly recover his strength. A second and third relapse, however, may then occur; but generally the disease ends with the first relapse.

Fig. 8.—Spirocheta of relapsing fever. *a*, Red blood-cells; *b*, white blood-cell.

The mortality is quite light—about 4 per cent.

The disease is caused by a spirillum or spirocheta to be found in the blood of the patient. It may be conveyed from person to person by bed-bugs and similar insects, or possibly by fomites, and is therefore quite contagious.

Immunity is not conferred by once having the disease. Poor food and bad hygiene seem to furnish the conditions necessary for the propagation of the disease.

The treatment is simply supportive—making the patient as comfortable as possible with cold sponging, the local application of heat, soothing drinks, and anodynes.

CHAPTER V.

PNEUMONIA.

The next most dreaded disease, and the one which in the cities is causing the greatest number of deaths, is pneumonia, or as called in some parts of the country, "lung fever."

As its name indicates, it is an inflammation of the lungs wherein the air-cells and passages become filled up with blood-corpuscles and fibrin, thus preventing the access of air to those parts. Those germs are, of course, usually obtained by inspiration from infected air; especially from air tainted by those already sick from some such disease. Most pneumonias are due to an infection from a mixture of germs (diplococci, streptococci, pneumococci) which shows that the chilling of the body and the lowering of its natural resistance have much to do with the origin of pneumonia. Therefore, most pneumonias occur during the changeable weather of spring and fall; in the aged, in February and March. It is the disease which carries off the aged and those weakened by chronic disorders.

The dangers of the disease are two-fold: First, the lung tissue may be so completely filled with the colonies of germs and the strings of fibrin from the blood that the patient cannot breathe (*i. e.*, the air cannot reach the blood to oxygenize it) and dies of suffocation. This is especially liable to happen in that variety called broncho-pneumonia, where the bronchial tubes and bronchioles are the seat of the primary inflammation and are therefore

more extensively involved than in the other variety, which is usually confined to a lobe and for that reason called lobar pneumonia. The second danger is due to the absorption of the bacillary toxins. As in typhoid fever, so here, the germs excrete poisonous matters which when absorbed by the blood so affect the nerve-centers and the heart that the normal action of the body and its organs is maintained only with the greatest difficulty. Thus, in lobar pneumonia (the kind ordinarily attacking adults) death oftenest results from heart failure. Pneumonia leaves unfortunately a weakened chest—a greater liability to take pneumonia or tuberculosis (consumption). The mortality of lobar pneumonia varies from 15 per cent. to 25 per cent., and is greatest among city dwellers and those whose homes do not give them enough air and light. Alcoholics, infants, and the aged are in special danger—two-thirds of the patients over sixty years of age die.

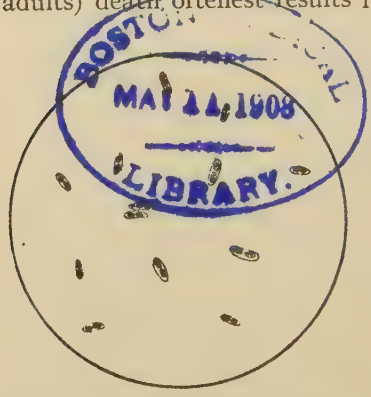
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Fig. 9.—The pneumococcus (Dr. W. K. Trimble).

Symptoms.—The disease begins, as a rule, with a sudden fever wherein the temperature runs up to 104° and 105° F., usually followed almost immediately by that combination of bad feelings and chilly sensations known as a chill. The temperature may go down to normal after twelve to twenty-four hours, only to rise again on the succeeding day. This fever runs, in lobar pneumonia especially, a steady course of from seven to eleven days, at the end of which it suddenly falls (crisis) and remains normal. In the children's pneumonia—bronchopneumonia—the course of the fever is more irregular and may

continue with intermissions of normal temperature for weeks. This latter may kill, therefore, by exhaustion as well as by suffocation.

The next symptom is the cough and expectoration. The paroxysms of coughing are usually racking and painful —even the taking of deep breaths may be painful. This pain is due not to the pneumonia itself but to the pleurisy which usually accompanies it. Hence we often find cases of pneumonia without this pain upon breathing and coughing.

The sputum has a rusty appearance and sticks tenaciously to whatever it strikes. This rusty appearance is due to the presence of changed blood. The amount of matter coughed up varies in different stages of the disease —and is greatest toward the end of the course of the disease when the masses of fibrin and blood-corpuscles in the alveoli begin to liquefy and the sputum becomes creamy in appearance. Inasmuch as this sputum contains almost pure cultures of the pathogenic bacteria, it should be sterilized, and so cared for that none may dry and get into the air for other people to inhale. In general, patients should not be allowed to spit on cloth and paper, as is done in some houses. Some receptacle containing a little antiseptic fluid (*e. g.*, a 5 per cent. solution of carbolic acid) should always be at hand, for the patient to expectorate into.

The pulse is usually strong and bounding—until the toxins begin to weaken the heart—and the rate in the neighborhood of 120 in a strong man of middle life. In the infants and aged, the rate is of course higher.

The patient usually has no appetite and the whole digestive tract is out of order; therefore, we do not find regularly either a constipation or a diarrhea; nor are the kidneys always affected in the same way. This makes necessary an individualization of treatment and diet for each patient.

Treatment.—Here, as in typhoid fever, the success of the treatment depends upon the nursing. First of all,

the patient should be put into the best ventilated and most airy room in the house—one in which an even temperature (65° to 70° F.) can be maintained. The bed should have a firm set of springs and a very clean and smooth mattress. A good bed-pan and conveniences for bathing the patient should, of course, be provided.

The first principle for the treatment is that the patient should not be allowed to stir unnecessarily. Sudden movement may cause acute dilatation of the heart with fatal results, and, besides, every ounce of strength should be conserved to throw off the disease. Therefore one should not move the patient or allow him to sit up, much less to arise to take food or even to attend to the calls of nature. In putting in a fresh sheet it should be pushed up against the patient's body with one longitudinal half in a sort of roll; then the patient moved over gently on the spread-out half of the clean sheet; and the folded part then smoothed out. A draw sheet would be of great help, but is not so necessary as in typhoid fever.

Usually the doctor prescribes a cotton jacket for the patient's chest. This is made by taking a roll of absorbent cotton (using the pound size roll) and spreading it evenly over the patient's chest and back so that it forms a uniform layer. (The patient should be held in a sitting posture for this. For this reason, if used at all, the jacket should be put on at the beginning of the treatment and left on until the need for it is past.) Over this, should be sewn a layer of cotton flannel, cut out to fit the neck and arms. This jacket should reach from the neck to the lower ribs. Its purpose is two-fold: to maintain an even temperature about the chest, and to cause something of a stasis of blood (a hyperemia) to resist the bacterial invasion. The pain of breathing may be lessened by applying an ice-bag to the affected area. If the patient will not permit this, heat may (if the doctor do not object) be used. The patient may be bathed two or three times in twenty-four hours with water at 70° to 80° F., if the

temperature remains high. Otherwise only the morning cleansing bath should be used. Visitors should be kept out of the room. The air must be kept very pure and all noise about the house prohibited.

Regarding the amount of food and drink given the patient: In general the food should be light but nourishing; thus, beef broths, chicken broths, beef teas, fruit juices, milk preparations, soft-boiled eggs, etc., are in great demand. Here again it is better to feed every two or three hours than with larger meals only three times a day. In some cases, but only where the patient can take it without burdening the heart too much, free drinking of water is helpful.

One of the chief duties of the patient's family is to prevent the spread of the disease; for undoubtedly infection plays the largest rôle in the production of pneumonia. All the sputum of the patient should be received either in a sputum-cup containing a five per cent. solution of crude carbolic acid; or, if that is impossible, on cloths which may be burned at once before they are allowed to dry. Likewise, all the material on which the patient coughs or sneezes should be sterilized before being used by other people. This applies to bed coverings, towels, dishes, and even the clothing of the attendants. Hence the value of washable gowns for nurses and doctors. Boiling is the most effectual means of sterilization; but formaldehyd vapor, or five per cent. solution of carbolic acid, are quite effective when they can be used long enough to penetrate the fabrics through and through.

Emergencies.—To meet the various emergencies that may arise will be the duty of the efficient nurse. It goes without saying that a careful record of the pulse and temperature should be kept; records being made not farther apart than once in six hours, unless the patient be sleeping. For the pain of breathing warmth is very helpful, and may be applied by means of the hot-water bottle even through the pneumonia jacket. For the

distressing cough the inhalation of steam is comforting. This is obtained by having a teakettle boiling in an adjacent room with a rubber tube extending from the spout to the patient. Or it may be obtained by means of a steam vaporizer placed at the bedside. This inhalation of steam loosens up the excretions, as well as quiets the irritated membranes. This vapor is rendered more efficient if sufficient turpentine or eucalyptol is poured over the boiling water to form a film.

As soon as the patient is free from fever an effort should be made to strengthen the lungs and chest. This can be done by seeing to it that the temperature of the room is kept even, at 68° to 70° F.; that the air in the room is always pure, and that the patient's chest and back are rubbed at least twice a day with cool water. The temperature of this rub should be lowered very gradually from day to day so that when the patient is ready to leave the house he can stand a rub with water practically ice cold. By "standing" a rub, we mean that the patient reacts upon the application of the cold—the skin glowing and the whole being feeling comfortable.

Pleurisy (pleuritis) is an inflammation of the serous membrane covering the lungs and lining the interior of the chest. There are two layers of this membrane and they rub upon each other in breathing. Normally, this is painless and easy because the membranes are lubricated with an appropriate fluid. When inflamed, the opposed surfaces are either drier than normal or kept apart by a collection of sero-purulent fluid. In the first case great pain is caused by every breath; in the second the lungs cannot move as freely as they should. When the inflammation subsides, there is left a thickened membrane which may cause some discomfort and is, of course, liable to renewed inflammation. In the effusive variety when there is empyema (*i. e.*, when the effusion is purulent) it is frequently necessary to aspirate the cavity or tap it to draw off the pus. This is done in the posterior axillary

line at about the fifth interspace. The skin is cleansed and anesthetized by the injection underneath it of a 4 per cent. cocain solution. Then a hypodermic needle is passed into the cavity. If the fluid be in too great quantity, or too thick to get out with so small a needle, a larger opening is quickly made with the knife and then the cavity is drained with rubber tubes. These tubes are, of course, sterilized before insertion and are fastened by safety pins to the bandage. The dressings must be changed every day (if not oftener) and the whole wound cleansed with some antiseptic solution.

As we have noted above, pleurisy is usually secondary to pneumonia. When it occurs without a pneumonia we have reason to fear that the cause is tuberculosis. In such a case, aspiration should be done at once in order to secure, if possible, some of the fluid for examination. If tuberculous, then the treatment and prognosis become those of consumption.

The treatment of pleurisy, secondary to pneumonia, is that of the primary pneumonia. However, the application of heat to relieve the pain and the giving of cathartics to cause an absorption of the effusion are measures specially aimed at the pleurisy. The patient usually prefers to lie on the affected side in order to keep the chest wall from great excursions in breathing.

CHAPTER VI.

SCARLET FEVER.

This is another disease in which the nursing is particularly important. Scarlet fever, scarlatina, and scarlet rash are all the same thing and simply show different degrees of virulence. The care should be the same

(especially with reference to isolation), because from a very mild case in which the only symptom is a slight rash, the worst sort of fatal case may be taken. The disease may be transmitted by a third person and by inanimate objects, such as clothing and toys.

While we know that the disease is infectious, we do not know its cause. Hence we must utilize general methods of prophylaxis and antisepsis. Nor do we know much more about the pathology of the disease beyond the general statement that it is a constitutional rather than a local affection and often begins with the tonsils as a port of entry. It affects, especially, the ears, kidneys, and central nervous system.

Its danger seems to be in the poisoning of the higher nerve-centers; especially those controlling circulation and respiration, through the absorption of bacterial toxins. The death rate varies from 3 per cent. to 30 per cent. of those attacked. The secondary effects of the disease on the ears, kidneys, or central nervous system may not appear for weeks, and these secondary disorders are therefore called sequelæ. It is probably because they are more carelessly nursed that the milder cases seem to produce the greatest percentage of sequelæ.

Symptoms.—The initial symptom is usually vomiting accompanied by a sore throat and followed by a high fever (105° to 106° F.). This comes on about a week after exposure to the contagion. Therefore we say that the period of incubation varies from one to seven days. The most prominent symptom is, of course, the rash, which appears anywhere from the second to the sixth day as thickly strewn fine points, first appearing on the trunk. It disappears after four days. Therefore for the first few days we must study carefully such sore throats, since a scarlet inflammation of the tonsils would be strongly suggestive of scarlet fever.

As a contrast to the rash of scarlet fever, the rash in measles is coarse, and appears first on the face. So,

also, smallpox. Chicken-pox has so scattered an eruption that it could hardly be confused with scarlatina. When one presses with the finger a portion of the body covered with the rash of scarlet fever, the part underneath the finger becomes white, but grows red again as soon as the pressure is removed.

The tongue is coated white, but soon the reddened papillæ project through the coating, giving the tip at least the appearance of a strawberry. Hence the term, "strawberry tongue," as applied to scarlet fever.

The temperature remains above normal for only about a week; but the disease is usually not over for nearly forty days; that is, the patient is capable of giving others the disease all this time.

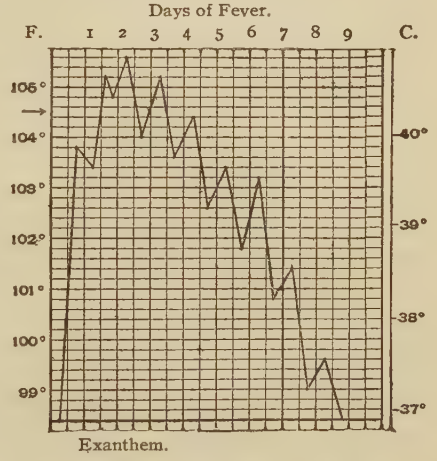

Fig. 10.—Temperature curve in scarlet fever (Sahli).

Another characteristic of the disease is the shedding of the skin, or desquamation. Desquamation begins at any time after the fourth week. In scarlet fever the skin peels off in rather coarse particles—from the hands and feet often in great strips—as contrasted with the desquamation in measles, where the particles are fine and branny. These particles are very infectious and should be well looked after.

Treatment.—First of all, the health authorities should be notified and the patient properly isolated. It is not necessary to put the patient in a separate house, pro-

vided a separate suite of rooms can be provided for him and his nurse. Thus, to put the patient upstairs while the rest of the family lives downstairs is usually sufficient. This isolation should be continued until desquamation ceases. The family should not care for the patient indiscriminately, but there should be one regular attendant who carefully disinfects both herself and her clothing before mingling with the family.

The room should be, of course, well ventilated and heated. The hangings and bric-a-brac should be removed as far as possible; but ample provision should be made for shading the room when the patient's eyes seem weak. In this matter it should be remembered that the room and its hangings must all be disinfected after the illness; and that easily destroyed material has no place in it. The temperature should be maintained at 68° to 70° F.; in no case should variation of more than 5° F. be allowed.

During the high fever the patient's diet should be restricted to fluids, such as milk, broths, teas, cocoa, etc. Water should be freely given. In order to make it more palatable it can be given in the form of lemonade or in carbonated solution. During convalescence the patient should have a mixed diet of more vegetables than meats. Zwieback, or oven-dried toast, soft-boiled or baked eggs, egg-nogs, oysters (if fresh), fruits (especially cooked fruits), in addition to easily digested meats will offer a good selection. In this disease the kidneys are especially liable to affection; hence the need during the days of convalescence of eating such things as do not irritate the kidneys in their elimination. The most important of these irritants to be avoided are spices, alcohol (wines, whiskey, brandies, etc.), rich meats, etc.

The temperature, when excessive, is best controlled by cold rubs; but as soon as the fever will permit the skin should be rubbed with a neutral oil, such as olive oil. This will not only diminish the itching, but will also keep

the infectious particles of cast-off skin from flying about loose in the air. Another very good lubricant is the following: Lanolin, 100; carbolic acid, 5; menthol, 5; and thymol, 5.

In order to disinfect her hands the nurse should keep a bowl of 1 to 1000 solution of corrosive sublimate standing at the door. It would be well, also, if there were provided for the doctor a long duster which he could slip on when he comes into the room. This, of course, should be kept hanging within the isolation boundaries, but outside the door of the sickroom.

The nurse should be particularly careful to see that the patient does not chill. This would cause some of the sequelæ mentioned above. The cause of such chilling is usually too great variation in the temperature of the room. That is, the patient may become overheated and the reaction would then cause a chill.

The sore throat of the patient, which may be so great as to show a membrane-like covering of the tonsils and posterior wall of the throat, would be relieved by boiling water in the room, with some eucalyptol in it. This soothes the membranes when the vapor is inhaled. A spray from a nebulizer or atomizer with mentholated oil should be used if the throat shows signs of ulceration. The sore throat may lead to middle ear infection (otitis media).

The earache should be relieved by dropping warm water into the ear and then plugging it (after drying) with cotton. Do not drop oil and laudanum into the ear; it does more harm than good. Applying external heat to the head also helps the earache.

Endocarditis is a dreaded complication of scarlet fever. This usually means a valvular lesion for the rest of the patient's days. Its discovery should be followed by careful restrictions in exercise and diet. (See "Heart Diseases.")

Nephritis usually does not appear until later. It

demands a milk diet, careful protection from changes in temperature and freedom from school duties for several months. (See "Kidney Diseases.") During the attack of acute nephritis, the patient must be kept in bed whether he has fever or not. This complication is usually detected by smoky, bloody and scanty urine. Routine examinations of the urine should become a habit in scarlet fever, so that such a complication may be detected at the earliest possible moment.

Sleeplessness, delirium and headache are best combatted by the application of cold, cold baths, the ice bag, or alcohol rubs.

The patient should wear in this disease—as in most others—only one garment while in bed; in this case a light nightgown. Allowing patients to retain their ordinary underclothes is simply to invite the chilling mentioned above.

In general it is a good plan to give a scarlet fever patient a sponge bath two or three times a day. The water should be made antiseptic by adding alcohol (to make it about a 30 per cent. solution). The sponging should be followed by the oil rub mentioned above. All clothing worn by the patient until the desquamation is entirely finished must be sterilized—for it may cause scarlet fever in some other wearer even a year or two afterward. Therefore, as long as the patient is kept in the house washable garments should be worn —or, if not washable, ones that can be burned. The attendant should also remember that the trays and dishes on which food is sent up to the patient may be dangerous to some child or susceptible person in the house, unless they are cleaned before being sent back.

Disinfection with Formaldehyd.—The room should be disinfected with formaldehyd. If no special apparatus is available, the following solution will be found useful to sprinkle sheets with for hanging on lines about the room. One gallon should be used for a small room.

Formalin (40% solution of formaldehyd) ....4 parts
Glycerin.....1 part
Water.....2 parts

The room should be filled with steam as soon as the sheets are hung up, and then closed for several hours.

Another method is to take a deep pail and set it in a large dishpan (with water in it) in the middle of the room. Into the pail should be poured eight ounces of potassium permanganate for each 1000 cubic feet of air space. Then when all the windows are closed, drawers and closet doors open, the nurse should pour over the potassium permanganate one pint of formalin for each 1000 cubic feet, and beat a hasty retreat. The room should be left closed for twenty-four hours. (For further details as to room-disinfection, see page 257.)

The safest drink for scarlet fever patients (aside from pure water) is milk. Beer should be prohibited, as should any tonic containing alcohol.

CHAPTER VII.

DIPHTHERIA.

Diphtheria and membranous croup are synonymous terms for an inflammation of the mucous membrane from the nose down to the lower end of the trachea or any part thereof, caused by a specific germ—the bacillus of Löffler. Of course, the inflammation may not cover the entire area described; and, in fact, is usually confined to one of the three divisions of this part of the respiratory tract: the nasopharynx, from the nose to the soft palate; the oral pharynx, extending from the soft palate and including the tonsils down to the root of the tongue; and the larynx, extending from the root of the tongue

down into the trachea. Diphtheria of the nasopharynx is the most fatal; but pharyngeal diphtheria is the most common. This inflammation differs from most inflammations in that it forms a covering membrane ("false membrane") over the part involved, made up of fibrinous and other exudates from the underlying tissue. This membrane is usually closely adherent to the underlying tissue and cannot be removed without bringing blood. Its color is usually a dirty white or gray. Inasmuch as diphtheria usually attacks children, and since in children the trachea and larynx are very narrow, there is danger of suffocation when the membrane fills up the available air-passage. Moreover, the bacilli excrete a very virulent toxin which has a special affinity for the heart and stops its action if secreted in appreciable quantity.

The disease is very contagious, for when the bacilli having been expelled from the patient's throat by coughing, sneezing, and hard breathing, settle on some object or person near at hand, they may either be carried away by some third person or be breathed in directly by persons moving about in the same room with the patient. This makes necessary the same sort of isolation that is necessary in scarlet fever; *i. e.*, the patient must be kept in a separate room and attended by some one who takes pains to disinfect herself thoroughly. The room must be disinfected at the end of the disease. This is best done with formaldehyd.

The incubation period of diphtheria varies from two to ten days. The disease usually begins with chilliness and headache, pains in the back and limbs, with fever running up to 104° or 105° F. Like those of tonsillitis, these symptoms may be so indefinite that the family may not think of the throat as being the part affected; hence, very often we hear of attacks of croup, and hear the family say that there is nothing the matter with the throat; nevertheless, an examination shows the presence of the false membrane and a true diphtheria. In order to decide

whether or not the case is one of true diphtheria, it is often necessary to take a cotton swab which has been sterilized and pass it over this membrane and then send the swab, as well as the membrane which has come off with it, to the bacteriologic laboratory for examination. It is, of course, necessary to use a sterilized swab for this, and the ones kept by the health officers and physicians are best.

In the old days before antitoxin was used, at least one out of every two persons attacked with the disease died. Now, frequently whole epidemics occur where not one in ten dies.

The disease usually lasts about ten days. During this time it is very important that the family keep the patient in an isolated but well-ventilated room where the atmosphere is kept moist by steam from a kettle, or from boiling water covered with a film of eucalyptol. The temperature of the room should be kept at about 68° to 70° F. It is also important that the patient be kept quiet and in bed during the whole course of the disease.

Treatment.—The treatment of the disease is very definite—the patient should be given a hypodermic injection of antitoxin at once. There are, in medicine, very few specific cures for diseases, but in antitoxin we have one of the specific methods of treatment, because antitoxin is the product formed by nature herself to resist the action of the diphtheritic bacillus. It is taken from the blood of horses which have overcome diphtheria; and therefore when given under modern conditions of cleanliness and skill is perfectly safe and harmless: and, on the other hand, is very efficient in its action. When given carefully, it rarely, if ever, is responsible for any bad effects.

The food, of course, is to be fluid, and to be given in small quantities. It is very essential to keep the mouth and throat as aseptic as possible. For this purpose hydro-

gen peroxid used very freely on a swab and as a gargle is as good as anything. When a spray is used, a 25 per cent. to 50 per cent. solution of glycothymolin or listerin will do very nicely.

The disease is notable for the number of bad conditions that it leaves behind. Laryngeal and other paralyses, pneumonia, otitis media and consequent deafness are some of the most common. Thus, we find children who cannot swallow, or cannot hear, or cannot speak aloud, or who become cross-eyed (strabismus). These sequelæ are, of course, less common when antitoxin is used at the outset. In view of this fact the convalescence of the patient should be watched very closely and the patient not allowed to indulge in physical or mental activity or gastronomic feats that may in any way endanger his enfeebled strength.

Sometimes, in spite of the use of antitoxin, there is a danger of suffocation from the clogged throat during the disease. It then becomes necessary for the physician to do a tracheotomy or intubate. The first is to put a tube for the patient to breathe through from the outside of the neck into the trachea below the obstruction. The other is to put a tube down the throat through the larynx to keep the passage open. In any case it is the special duty of the nurse to keep the tube clean and clear of obstruction. In case of obstruction the nurse should summon the physician, but should also try to open the passage. Suction is usually the best method and should be done with the lips if other means fail (although such a method is exceedingly dangerous), but can usually be accomplished by using a rubber bag or syringe with a tube fitting the lumen of the tracheotomy tube. In cases of tracheotomy, some such means of suction should be provided beforehand. The nurse should remember that it is suction, not compression, that is needed. Artificial respiration is also useful in these cases of suffocation.

Pneumonia is sometimes a complication and is then very

fatal. With antitoxin used at the outset, it, however, rarely develops.

The enlargement and ulceration of the cervical glands is a frequent sequel. Rubbing the neck with liquid guaiacol during the fever may help to prevent this mishap.

Members of the patient's family and others who have been exposed to the disease should be given an immunizing dose of diphtheria antitoxin. This does much to prevent the spread of the disease.

CHAPTER VIII.

MEASLES.

In this group of diseases in which the care of the patient plays the largest rôle, measles (rubeola) occupies an important place. Like scarlet fever, its pathology is not surely known. We have to do, however, with a constitutional rather than a local disease. The germ gains entrance probably through the respiratory tract—*i. e.*, through the throat or lungs—and seems to be disseminated by the blood throughout the body. It usually requires two weeks for the disease to show itself after infection, though this may occur in one week.

Symptoms.—The disease begins with a general feeling of being unwell, then the patient begins to sneeze and feel chilly; his eyes water and his nose "runs" (the general symptoms of a cold in the head). Then the patient begins to cough. This lasts for only thirty-six hours or thereabout. The temperature begins about this time to rise slowly and gradually, and after reaching 103° to 104° F., remains there for about four days, when the temperature usually falls again to normal. After the fever is well developed, a rash appears in well-defined

separate red spots, first on the face and forehead and only afterward on the trunk and limbs. These two characteristics differentiate this rash from that of scarlet fever. The rash of the latter appears first on the trunk and the spots are extremely small. "The symptoms increase till the fourth day. At that period (although sometimes a day later) little red spots, just like flea-bites, begin to come out on the forehead and the rest of the face. These increase both in size and number, group themselves in clusters, and mark the face with largish red spots of different figures. These red spots are formed by small red papules, thick set, and just raised above the level of the skin. The fact that they really protrude can scarcely be determined by the eye. It can, however, be ascertained by feeling the surface with the fingers. From the face—where they first appear—these spots spread downward to the breast and belly; afterward to the thighs and legs" (Sydenham, quoted by Osler). During all this time the eyes of the patient are very sensitive to light, and appear somewhat inflamed. Another of the earliest symptoms is the appearance of bluish white specks surrounded with red areolæ on the mucous membrane of the mouth and throat. Since these spots (called Koplik's spots) appear a day or two before the eruption on the skin, they help greatly to diagnose the disease. In order to see them the patient should be taken to a window so that daylight can strike the interior of the cheek, whereupon they appear as brighter than the surrounding membrane on a line with the crowns of the molar teeth. Desquamation begins after the eruption disappears. It is fine and branny, in differentiation from that of scarlet fever, which is coarse and sometimes in shreds and scales.

Treatment.—The patient should be isolated and put in a large and well-ventilated room, and the bed so placed that the light does not fall on his face and eyes. In fact, if the room be darkened with red curtains the patient feels very much better. This room should be

kept at an even temperature,—between 68° and 70° F. The quarantine should be maintained for three weeks.

The patient should be sponged off with tepid water and soap at least once a day. If this is followed by a gentle rub with olive oil, the patient's skin will be in better condition and the contagious particles of skin will not fly so readily about in the air of the room. In carrying out these directions, the nurse should remember how infectious measles is, and should therefore disinfect herself before going into other parts of the house.

The diet should be light but nourishing. Similar dietaries to those mentioned for scarlet fever should be used.

There is a considerable liability of the patient's suffering from bronchitis as a development of the measles. Even bronchopneumonia with fatal termination develops frequently. Therefore it is well to pay great attention to the above injunctions as to care and also to keep the air of the room somewhat moist with some antiseptic vapor, such as that of water and turpentine. The soreness of the throat is less noticeable when this vapor is used than without it. The time of greatest danger is during convalescence, just when an "ambitious" patient wants to be up and about. Needless to say, during all this time the patient must be kept out of the line of drafts and away from all exposure either to heat or cold.

The patient's eyes are so weak that he should not be allowed to use them for reading or similar work for some time after convalescence has set in—certainly not during the progress of the disease.

This disease also produces otitis media. Hence the need of careful cleansing of the nose and throat during all the first week of the disease. Irrigation and spraying should not be carried out with too great violence, otherwise the very act may drive the infectious masses back up into the Eustachian tube.

Gangrene of the cheek (noma, or cancrum oris) may

also result if the mouth is not kept thoroughly clean. This is at the best disfiguring, but usually fatal.

Hemorrhagic or black measles is a specially fatal form of the disease. The eruptions are filled with blood instead of serum.

German measles (rubella) is a disease that sometimes simulates measles, sometimes scarlet fever. Its incubation lasts from ten to sixteen days. The onset is gradual and the symptoms mild: headache, sore throat, red eyes, enlarged cervical glands, etc. The eruption begins twenty-four to forty-eight hours after the fever, beginning on the face, and is brightest on the flexor surfaces of the arms and legs. It lasts two or three days. The eruption lacks the stippling of scarlet fever and the crescentic arrangement of measles.

Quarantine should be maintained as in measles (three weeks).

The enlarged cervical glands seem to be the characteristic symptom. They require the application in rapid alternation of hot and cold fomentations.

In general very little treatment is required, beyond rest in bed and restricted diet.

CHAPTER IX.

WHOOPING-COUGH.

Another distressing disease of childhood is whooping-cough (pertussis). Nothing definite is yet known of its etiology except that it is infectious and very easily communicated from one child to another.

It usually takes from five to ten days after being exposed to the disease for it to appear. It begins gradually with a general malaise. There may be said to be two

stages: a first, or catarrhal, stage lasting about ten days, wherein the patient apparently has a cold in the head, with some watering and burning of the eyes, a bronchial cough, no appetite, and a slight fever. Then comes the paroxysmal stage, which may last anywhere from four weeks to four months. The characteristic symptom of this stage is the ringing whoop to the cough. "There are first a series of short, jerky, expiratory coughs, followed by a long-drawn inspiration, which produces the whoop" (Paul). This paroxysmal cough may occur from four to one hundred times a day; and may be so severe as to cause vomiting and to congest dangerously the blood vessels and produce actual subconjunctival hemorrhage in the eyeballs and other delicate tissues.

Because of its long duration and severe paroxysms, the danger from whooping-cough is usually from exhaustion and heart failure. Thus, babies sometimes become so worn out with the disease that an extra severe attack of coughing may be sufficient to cause death from heart failure. The mortality of children under one year is 25 per cent.; of those between one and two years, 15 per cent.; and for the older ones it varies from 5 to 15 per cent.

For this reason the greatest care must be taken of the little sufferers to maintain their strength. The first duty of the caretaker is, of course, to see that they receive nourishment. Naturally, the act of eating and swallowing brings on a paroxysm of coughing which ends only when the child vomits and rejects all that he has eaten. Hence the children can be fed only the most easily digested and nourishing food. It should never be given in a quantity sufficient to overload the stomach, and thus excite either coughing or indigestion. Hence the rule given in the preceding fevers can also be applied here: Feed the child every two or three hours with light meals. The habit some children have of bolting their food without mastication is liable to excite the cough as well as cause indigestion; hence special care should be taken to insure

a thorough mastication of all solid food. When this is difficult, it is better to use only the fluid or semisolid foods; thus, we would recommend eggs beaten in cream (always without alcohol), custard, soups, beef teas, thoroughly cooked rice and breakfast foods (employing variety to avoid monotony), etc.

Delicate children should be kept in large, well-lighted and ventilated play-rooms; but where the weather is even and moderate, the ordinary patient should be kept almost entirely in the open air. Their play should not get boisterous; but gentle exercise is better than letting them fret in chairs and beds. The sleeping room must be especially well aired, both day and night. A bronchitis tent may be employed to assist in confining the steam generated for the patient to inhale (see page 118).

A tight bandage about the abdomen will greatly assist the child in the paroxysms of coughing. This should be at least six inches wide and drawn as tightly as can be worn with comfort.

Medicinal treatment should be left in the hands of the physician; it is not wise to experiment with crude remedies recommended by the gossips in this or any other disease. Some relief is sometimes obtained for the nocturnal coughing by burning some bronchial sedative in the sleeping room. This also should be prescribed by the physician. The objection to the use of fumes is that it deprives the patient of fresh air. In the early days of the disease great good may be accomplished by cleansing the nose and mouth with hydrogen peroxid, either in full strength or in a spray of equal parts of glycerin and the peroxid.

It is, of course, the duty of the family to prevent the spread of the disease; therefore the patients should live and play by themselves as much as possible. Special attention should be given when children who have not had the disease are in the house or neighborhood. This isolation should be kept up for at least six weeks. When

the air is filled with dust, as in the city, it is better to carry the patients to the country, where they may have pure air and be out of doors. This is especially desirable during the convalescence of very young children.

The sputum of patients is contagious; therefore, when possible, it should be collected and disinfected. At any rate, the clothing and all with which the patient has to do should be disinfected before put with that of the rest of the family.

CHAPTER X.

SMALLPOX.

Smallpox (variola) has degenerated from being a fearful scourge to a weakened disease of rare mortality. This is due to the immunity gradually given us by a century of almost universal vaccination. This gives us reason to believe that if we can keep our people vaccinated for another generation the disease will have been nearly stamped out. Therefore, every parent should see to it that his children are vaccinated in infancy; and again at about twelve to fifteen years of age. Vaccination at the hands of a clean and expert physician is almost painless, and is certainly harmless; and since it means the extermination of a plague it is a moral duty for us all to be vaccinated.

The weakened form of the disease which appears when patients have been rendered partially immune by an old vaccination is called *varioloid.* It possesses the general character of variola, but the symptoms appear in much lessened force.

Variola needs, on the other hand, to be distinguished from varicella or chicken-pox. This, of course, is quite different from smallpox in its effect on the general system;

yet sometimes it is hard to distinguish from varioloid. Because of the importance of the matter a physician should be called to examine any case of apparent chicken-pox about which there is any doubt.

Variola is of Oriental origin and was introduced into Europe by the crusades of the thirteenth century. It was brought to Mexico by the Spaniards in 1520—it is estimated that 3,500,000 of the Mexicans died from its effects at that time. It appeared in the United States in 1649 at Boston, whence it spread westward with terrible effect.

It is, then, a highly contagious disease. One cannot take the disease unless he has been exposed to the infection originating from a patient. Like typhoid fever, scarlet fever, measles, etc., it does not arise anew in a person hitherto healthy. Therefore, it is a preventable disease, and one which should be exterminated. The infectious material is easily carried by the air (winds), and can also be transmitted by a third person. It is generally believed that the port of entrance to the system is through the respiratory tract. In the unvaccinated the mortality runs from 25 per cent. to 55 per cent.; in the vaccinated, from 0.5 per cent. to 2 per cent.

Symptoms.—It takes from eight to fifteen days for the disease to manifest itself after the receipt of the infection. The beginning symptoms are very indefinite and are quite often mistaken for those of the grip (or influenza). The patient for the first two or three days simply shows a fever, with coughing, vomiting, headache, etc.—all the marks of a severe infection, but nothing pointing to any particular localization. The fever may be quite high, but it usually goes down about the third day, when the eruption begins to appear—first on the forehead, and then spreading downward. In the fully formed eruption there appears a central depression, which is characteristic of smallpox. Another characteristic is the feeling as if a small shot were imbedded underneath

the papule when the finger is passed over it. This papule gradually fills with fluid which is first clear and then grayish (purulent). Finally, the fluid contents dry up and the eruption comes off as a scale. After the eruption has been out for a day or two, the second fever period begins. This is the "suppurative" fever, and lasts for several days (eight to eighteen). When this high continued fever remits, then the greater part of the

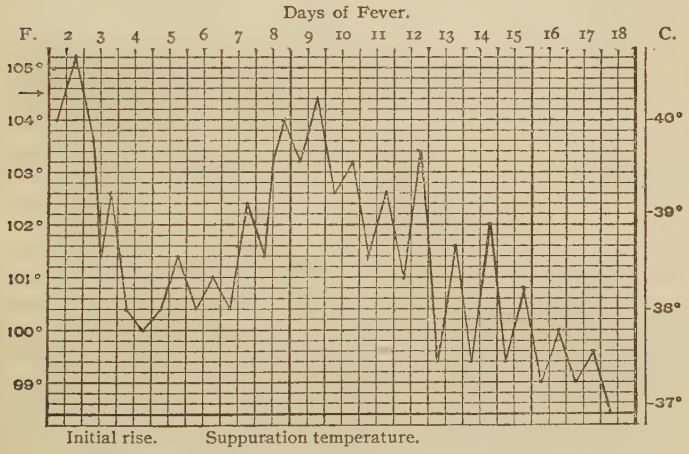

Fig. 11.—Temperature curve in smallpox (Sahli).

disease is past. Death may occur at any time; but the danger is greatest during the fever period.

The lighter cases have only scattered papules (discrete variola) on the skin. The old-fashioned kind usually presented the horrible picture of all these eruptions flowing together (confluent smallpox), while the deadliest form of the disease shows blood instead of clear serum in the vesicles. This latter is the hemorrhagic or black smallpox, which is comparable in appearance and mortality to "black" measles.

Treatment.—The first duty of the family is to isolate the patient; this should be in a house set apart from neighbors, for the contagion is very easily borne by the wind from house to house. Here the patient should remain about five weeks, or until desquamation has ceased and the skin is entirely smooth and clear again.

The patient with a severe case needs a great deal of care. His skin should be kept moist with an antiseptic oil or carbolized vaselin. If a child, the fingers should be kept covered with something soft to prevent scratching. The high temperature must be reduced by cold rubs. The food must be carefully chosen and as carefully cooked.

Inasmuch as smallpox is apparently wind-borne, disinfection of all who have to do with the disease is very important. In the first place, the patient should be isolated, as we have noted above, not only in a separate room, but in a separate building. Then, the physician who visits the patient must be very careful about carrying the infection. There should be provided for him gowns which he can slip on outside the door. Before doing this he should remove his own coat and vest. After visiting the patient he should disinfect his hands and face and hair and beard by the use of corrosive sublimate solution or alcohol. The nurse must remain isolated, and should only mingle with other people when absolutely necessary, and then only after complete disinfection, which should include a change of garments and an antiseptic bath. The toilet and bathroom used by the patient or nurse should be disinfected daily with formalin or crude carbolic acid. In fact, everything that comes in contact with the patient should be either boiled or cleansed with a 1 to 1000 solution of corrosive sublimate or, if metal, exposed to formaldehyd vapor.

One great danger in treating a case of this kind is that our solicitude for the patient prevents us from giving him good ventilation. There is a well-known fear among the people of such patients "catching cold" and thereby "driving

in" such an eruption. Of course, such chilling is dangerous, but it is almost as fatal to keep the patient in bad air. For this reason great attention should be given to keeping the air in the sick-room constantly renewed; but seeing to it also that the patient is guarded by screens so that he does not feel any draft.

Good results have been obtained by excluding all but the red light (actinic rays) from the sick-room; *i. e.*, by having every inlet for light colored red. This is usually impossible of accomplishment without the greater danger of shutting off the ventilation. In hospitals it sometimes may be carried out.

If the patient survive the disease, it is exceedingly important that he be kept in bed until all danger of relapse is passed, on the one hand, and of infecting others, on the other. It is better to keep him too long than too short a time. Before the patient is allowed to mingle with the world again he should be given a very thorough antiseptic bath, the hair and the beard should be cleansed with alcohol (50 per cent.) and the body washed with 1 to 1000 corrosive sublimate, or alcohol, or both. If, however, the patient die, it is more than ever important that there be no public funeral; that the corpse be wrapped in an antiseptic sheet, saturated in a solution of 1 to 1000 mercuric chlorid; and that every precaution be taken to prevent the exposure of non-immunes.

Very great efforts have been made to prevent pitting, but with small success. The best results have been obtained by the use of the red light, as indicated above. Where this has been impracticable, fairly good results have been obtained by the bandaging up of the face and hands with 10 to 20 per cent. solution of ichthyol, and leaving these bandages on for as long a time as possible.

Since the disease is very debilitating, all sorts of sequelæ are apt to follow, varying from mental derangement to rheumatism; therefore, in the days following smallpox, great attention should be given the convalescent, that

he does not make a heavy drain on his bodily or mental powers.

Vaccination should be done on children when very young. It is essentially inoculating them with the disease, weakened by passing through cows. The disease is thereby rendered so weak that it makes only a local manifestation. Vaccination should be made on the arm, unless the patient who desires the leg used is willing to take extra precautions to keep the leg quiet and clean during the week following vaccination. It takes about three days for the vaccination to show itself by reddening the skin and producing papules. These reach maturity (*i. e.*, are filled with fluid) in about six days. After the tenth or twelfth day the vesicle dries up and a scab is formed which may remain adherent for a week or so. The scar, at first red, becomes white with time.

The chief precaution connected with vaccination is the keeping of the dressing put on by the doctor unmoved and in place for the necessary time. It should not be removed to see if the vaccination is "taking" or to satisfy idle curiosity or even to stop itching. The patient may not feel at all unwell. On the other hand, he may have a slight fever, lose his appetite, and experience a general malaise. Infection, from contamination, of course produces the usual symptoms of abscess formation.

CHAPTER XI.

CHICKEN-POX (VARICELLA).

Fortunately, this disease does not require a great deal of attention. Nevertheless, its symptoms are so similar to those of other eruptive diseases that they may cause confusion and some alarm. It is very contagious and

has an incubation period varying from ten to sixteen days.

The disease begins with a slight fever (101° to 102° F.) and a feeling of chilliness, aching in the back and extremities, and sometimes with vomiting. After about twenty-four hours, the eruption begins to appear, first upon the scalp and face but most definitely upon the trunk (especially the back) with large isolated papules. These appear in crops and remain out for about four days, and then dry up and disappear.

No particular treatment is needed; therefore the family usually takes complete charge of the patient. The sick-room should be selected for its capability of being kept light and airy, and then the patient kept in it for one week in spite of the fact that he often feels like running out on the streets. Special attention should be paid to keeping the nose, throat, mouth, and teeth clean. For this purpose a simple spray with listerin or glycothymolin, in 50 per cent. solution, would be helpful. Sometimes a gargle of the throat is needed, in which case a 25 per cent. solution of either of the drugs mentioned would be very good. The teeth should be cleaned two or three times a day with a brush wet in peroxid of hydrogen of the strength ordinarily sold in the stores. It is very important that the bowels be kept open, and therefore a laxative diet, as well as small doses of calomel or salts, should be used as the occasion demands.

It is well not to indulge the patient's craving for food too much. A large part of his craving arises from the fact that he has nothing to do except eat. For this reason it is a very good plan to give the patient liquid food every three hours, at least during the fever period. This food might vary from meat broths to milk toast and chocolate.

Inasmuch as there is a possibility of confusing chicken-pox with mild cases of smallpox or similar diseases, it is well to have a physician look at the case at the beginning.

CHAPTER XII.

MALARIA.

Malaria, like charity, has been used as a cloak to cover a multitude of sins. When any one has felt bad, has had indefinite chills, some slight fever, or it may be rheumatic aches in different parts of the body, for which he could assign no other cause, the charge has been laid to malaria. Moreover, careful investigation has gone to demonstrate that few of the troubles called so by the laity are really of malarial origin, and are for the most part due to bad digestion or more especially bad elimination through skin, kidneys, or bowels.

Malaria itself is due to an invasion of the blood by a microörganism of the protozoön class. This organism cannot spend its entire life-cycle in human blood; that is, it cannot live and multiply in the blood alone, but must spend some of its existence outside of the human body. While in the blood it lives within the corpuscles themselves. When it reaches that stage when it should pass out from the body each organism (called now a malarial plasmodium) shatters the corpuscles in which it has been living, and divides, swimming about free in the blood plasma. When this occurs, the patient has fever and chills with all the other symptoms of true malaria. The other part of the life of the microörganism is spent in the anopheles mosquito. It reaches the mosquito when the latter bites a human being and sucks up the blood. From the bill, it reaches the digestive tract of the mosquito. After a few hours it burrows into the wall of the mosquito's intestine and passes thence into the tissues of the mosquito, changing its form, becoming what we might call the larva of the original protozoön. When it becomes mature enough to pass again into the human being, the microorganism wanders through the tissues of the mosquito to

the salivary glands at the base of the proboscis, so that when the inhabited mosquito pushes its proboscis through the skin of a human being the microörganism passes easily into the fluids of the individual bitten.

These plasmodia belong to different groups, each of which has a definite period of existence. Thus, one race of plasmodia in a blood-corpuscle matures and breaks out in approximately forty-eight hours; another requires seventy-two hours, and still a third race breaks out at more or less irregular intervals. Hence, when the first

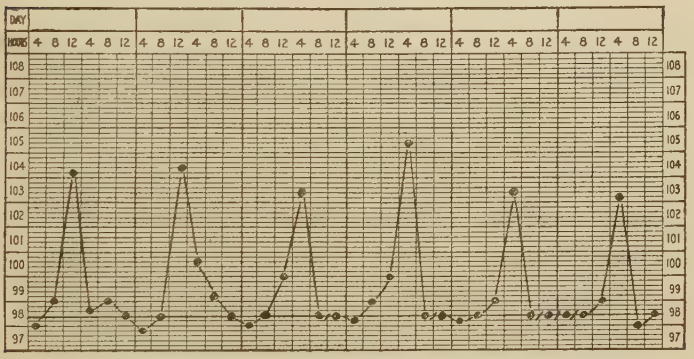

Fig. 12.—Temperature chart of intermittent malaria (quotidian) (Paul).

class of plasmodia inhabits a patient, he has chills and fever every other day; the second class gives him chills and fever every third day; while the third class gives him an irregular fever. The first class is therefore called tertian; the second, quartan; and the third, estivo-autumnal malaria.

The diagnosis of malaria, therefore, depends on finding these organisms in the blood; and without such finding a diagnosis of malaria is simply guess-work. It is necessary, therefore, for any physician who would diagnose malaria to have access to a high power microscope, and

be able to use the modern methods of staining the blood for examination.

Symptoms.—The symptoms of an acute attack are a cold stage lasting from one-half to one-fourth hour, during which time the face becomes blue and pinched, the pulse rapid and small, the urine increased, but the temperature may be as high as 106° F. The hot stage follows and reaches its maximum in an hour or two. Here the face is congested, the pulse full and bounding, headache is intense and throbbing, delirium may be present, urine

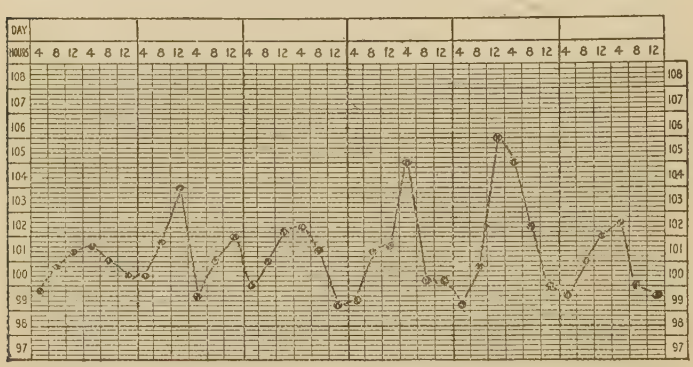

Fig. 13.—Temperature chart of remittent malaria (Paul).

scanty, thirst increased, temperature same as in cold stage. The sweating stage is the stage of abatement. All the symptoms gradually disappear and the patient feels well. The whole attack lasts from eight to fourteen hours.

The estivo-autumnal malaria tends to produce a fever of the remittent (bilious) type. The temperature is not so high as in the tertian or quartan attacks described above. Jaundice is common, as is also epigastric pain. The gastro-intestinal symptoms are so pronounced that it may be mistaken for typhoid fever or vice versa. The fever usually gradually declines without any sweating stage.

Pernicious malaria is found more often in the tropics and appears in three forms:

(*a*) Choleraic with low temperature, vomiting, choleraic diarrhea, cyanosis, feeble and rapid pulse, collapse, and great mortality.

(*b*) Comatose with a regular malarial paroxysm followed by stupor, hyperpyrexia, Cheyne-Stokes respiration, and collapse ending in coma.

(*c*) The hematuric form with blood in the urine and hemorrhage from the mucous membranes. Here there is no febrile paroxysm.

The long continuance of malaria produces a cachexia with bleeding of the mucous membranes, uterus, and kidneys. The skin is of a peculiar sallow hue, malaise is constant, and the spleen is enlarged.

We would reiterate the necessity of using a microscope to determine whether or not the patient ill with chills and fever has really malaria; because that same line of chills and fever might be produced by a consumptive who has fever every afternoon with the skin sweating at nights. Pyemia also produces a similar condition; so, also, does an abscess in the kidney (pyelitis). Ulcerative endocarditis (or a purulent inflammation of the lining membrane of the heart) produces similar febrile conditions, and gallstones and empyema produce such a condition of intermittent fever. Hence the physician who depends for his diagnosis of malaria upon the character of the fever will often go wrong. Further, the estivo-autumnal variety begins often just like typhoid fever and one may often be mistaken for the other.

Treatment.—The treatment of malaria has fortunately become specific, and we have in quinin a remedy which will kill the plasmodia. Of course, besides the quinin, general and sensible means of treatment must be used, such as proper diet, proper cleansing of the skin, and proper evacuation of the bowels.

So far as the family is concerned, the treatment of

malaria is not so much the giving of quinin—for that should be directed by the physician—but the prevention of the spread of the disease. In the first place, mosquitoes should not be allowed to bite the patient ill with malaria, because in this way they get the material to infect other people. Every patient ill with malaria should be screened off and otherwise protected from mosquitoes. Second, mosquitoes should be as nearly as possible exterminated. This can be accomplished by two measures applicable to every community. First, the land should be drained and all stagnant pools cleaned out; second, all necessary pools and water reservoirs should be covered every fortnight or ten days with a film of petroleum. This prevents the young mosquitoes (larvæ) from getting the air necessary to live and therefore suffocates them, and also prevents mature mosquitoes from laying their eggs in such water. It therefore rests in the power of any community to free itself from mosquitoes and malaria.

If one lives in a malarial country where one has not the power to proceed against the colonies of mosquitoes, then one should avoid going out after dark and one should have all the doors and windows of the house thoroughly screened.

The care of the patient while suffering from chills and fever is the same as that of any other fever patient. He should be put to bed, kept quiet and warm, bathed once or twice a day, and fed on very easily digested food. A long continuance of malaria necessarily produces marked changes in the blood and internal organs. Therefore, such a patient should be aided by a line of treatment, the chief end of which is to stimulate the regeneration of the blood and the restitution of the liver, spleen, and other organs particularly affected by the disease. This demands excellent food, consistent steam and hot-air baths, massage, and judicious exercise. Such drugs as arsenic and potassium iodid may be found useful, but in general institutional

treatment wherein the patient's whole life may be regulated will be found most effective.

CHAPTER XIII.

MUMPS.

The salivary glands which supply the digestive fluid for the mouth consist of the two parotids lying deep in the cheek just in front of the ear, the two submaxillaries lying under the lower jaw, at about the angle, and the sublingual, which almost fills up the space between the submaxillaries. These glands can be infected by way of their ducts which empty into the mouth, or by way of their blood supply. Fortunately such infection is rare. The duct of the parotid glands empties on either side just opposite the upper second molar tooth and is therefore more exposed to infection than the other two ducts which are protected by the tongue.

Mumps is an epidemic inflammation of the parotid glands. It is one of the so-called diseases of childhood, but attacks adolescents and adults as well. Under one year of age there is less susceptibility than between that age and puberty. It has no mortality. Its most serious complication is the secondary inflammation of the testes (orchitis) or ovaries in those who have reached puberty.

The disease is very painful because many nerves and blood-vessels pass through the substance of the gland and are pressed upon by the swelling. This prevents the opening of the mouth wide. The swallowing of acid foods is painful because the acids stimulate the glands to activity. One side is usually attacked before the other. There is no formation of pus or abscess formation, unless from some complicating infection.

It usually takes the disease two or three weeks to appear after the patient has been exposed, but it may appear within forty-eight hours.

It begins with the swelling of the cheek and pain in the movement of the jaw. The fever is continuous and rarely goes above 101° F. The fever continues, including the gradual subsidence, for a week or ten days, after which the patient feels as well as ever.

The chief complication is for patients who have reached the age of puberty, for in them the genital organs are frequently attacked by what might be called an extension of the disease—a very painful swelling with a moderate fever. The only way to prevent this is to keep the patient quiet and in bed from the very onset of the disease. However, other very serious disorders have arisen in the course of mumps, such as cerebral disorders, delirium, coma, pneumonia, endocarditis, etc. These show that the treatment of the disease is not to be neglected.

The disease is so contagious that patients should be isolated; for it is not at all safe needlessly to expose small children. While the disease itself does little harm, its complications may jeopardize life.

Treatment.—The treatment consists in keeping the patient quiet and in keeping the swollen glands warm and soft. Patients should not be allowed to play out of doors unless the weather be perfect. In general the keeping of the patient in one room of even temperature is safer. Application of kaolin poultices (known also as clay poultices, kataplasma kaolini), applied thick and warm, usually keeps the patient free from pain. The mouth should be cleansed frequently with hydrogen peroxid.

Because of the difficulty in swallowing the food should be fluid or semi-solid, and should not be of such character as to demand mastication. Broths, soups, bread and milk, junkets, custards, egg-nogs, etc., can all be used if given judiciously.

CHAPTER XIV.

INFLUENZA.

Since 1889, one of the most common complaints in this country has been influenza, or "grip." It appeared at that time in the form of a widespread epidemic, and the populace thought it a new disease. But it is really the recrudescence of an epidemic disease that has visited various parts of the civilized world since 1173 at least. In the nineteenth century alone epidemics occurred at one place or another in the years 1830–1833, 1836–1837, 1847–1848, 1889–1890. These epidemics have been notable for the rapidity with which they travelled from one city to another, and also for the fact that very few people escaped the disease. For instance, in May, 1889, the disease appeared in Bokhara (Asia); it travelled westward by the great caravan routes and reached Moscow in September and St. Petersburg in October. Then, following the routes of trade and travel, the disease reached Berlin in November, London in the middle of December, and New York city by the end of the year. The universal susceptibility to the disease is shown by the fact that at least 40 per cent. of the population was attacked. Infants in arms seem to be the only ones which as a class escaped. Since that epidemic the disease seems to be still with us and every winter many new cases are reported.

Like malaria and other common diseases, there is a tendency to use influenza as a scapegoat and give its name to very many different conditions which seem to have some doubt as to their proper classification. Thus many cases of malaise, probably due to very different causes, are called by the name of grip in order to save the person doing it the necessity of more careful study. The real disease, however, is caused by a minute bacillus (discovered in 1892 by Pfeiffer), which appears in many

of the body fluids, but more particularly in the secretions of the nose and throat. Undoubtedly some of the worst cases, however, are caused by mixed infections of this bacillus with other pathogenic germs. Hence, unless one finds the bacilli, the difficulty of making the diagnosis.

While the usual point of attack is the respiratory tract—the nose, throat, or lungs—still some cases of meningitis appear to have been caused by it, as well as some very severe gastro-intestinal disorders. In general one expects to find that the bacilli have obtained entrance to the blood; for the symptoms of severe general prostration which are characteristic of the disease could only be explained on that supposition.

The mortality of the disease in the epidemic seems to have been less than one per cent. But the patients are generally left with their bodies so much weakened that they frequently die of other diseases induced by that weakened condition. Another bad feature of the disease is the fact that there seems to be no immunity granted by having recovered from it, and patients are more susceptible than before to attacks of influenza.

The incubation period of grip varies from one to four days. The usual initial symptoms are a chill and fever, or the sneezing and coughing of a bad cold, or the onset suddenly of great prostration and aching without other premonitory symptoms. The attack of the disease proper lasts only a few days, but the weakness and susceptibility to other diseases will remain many days.

The most prominent symptom is the utter prostration of the patients. The other symptoms are the fever, which is of the irregular type, and the pains and aches—pains in the joints, pains in the back, and aches everywhere. These pains and aches should, however, never lead the nurse to give the patient the coal-tar derivatives as either analgesics or antipyretics, for these patients cannot stand depressing drugs. She will note, if she be observant, that the best physicians feel the necessity of supporting the

patient's strength from the very beginning, and that they use only eliminants and antiseptics for their drug treatment, and these only so far as they can without weakening the patient. This leaves then the field open for the nurse to show her skill in easing the patient by massaging the aching back and limbs, and by using over the most tender points hot fomentations. She has the chance also to show skill in dieting the patient by giving egg-nogs, beef broths, junkets, etc., so prepared and served that they whet the impaired appetite and stimulate the weakened digestion. Needless to say, the patient's bowels must be kept in good order by cathartics, such as calomel and magnesium sulfate. The kidneys and skin should be kept active by having the patient drink much water—a cupful every hour, for instance. Sometimes a sweating bath should be given and the nurse can arrange for this by putting a rod on each side of the bed from the head to the foot about eight inches above the patient's body. Over this should be thrown a pair of flannel blankets, tucked in at the foot of the bed and about the neck of the patient. The heat is generated by an alcohol lamp placed by the side of the bed, and conducted within the air-chamber made by the blankets by means of a piece of gutter-spout. The patient should lie in this hot-air chamber with only a sheet around him. His head should be kept cool with an ice-bag or cold compress. The temperature should reach at least 200° F.

Since the disease is contagious, isolation of the patient and disinfection of all secretions should be practised. This is the only way by which we can hope to free ourselves from the regular recurrence of the disease. For this reason it is not well to allow the caressing and kissing of the patient by the friends and family. The patient's clothing and linen should be sterilized before being put with that of the rest of the family. In bathing the patient the nurse would do well to use 30 per cent. alcohol and other antiseptic solutions. This would have a tendency

at least to weaken the bacteria lying on the skin and in the pores. It would also protect the nurse from becoming infected herself. Where it is not easy to use other antiseptics, formalin in as high a dilution as 1 : 5000 will be found useful.

CHAPTER XV.

ERYSIPELAS.

Erysipelas is caused by the same germ, the streptococcus, as that which causes abscesses when it settles in circumscribed subcutaneous tissues; pneumonia, when it reaches the lungs; and rheumatism when it is in the blood and is deposited in the joint cavities. In erysipelas the germ is just underneath the skin in the loose subcutaneous tissue,—which, since it is so loose and full of open spaces, permits the germs to pass from place to place practically unhindered. The local symptom of the presence of the germ is the reddening, thickening, raising and heating of the skin. It all depends upon the condition and sensitiveness of the individual whether or not these local symptoms are accompanied by great constitutional disturbance; *i. e.*, whether the patient begins to suffer generally and has a fever or impaired digestion or even delirium.

The most common location for erysipelas is in the face. This is also the most dangerous because the germs may obtain access to the passages communicating to the brain and thereby set up a meningitis or some other fatal cerebral trouble. Frequently facial erysipelas is caused by an infection of the tonsils passing upward along the mucous membrane and out through the nose to the tissues underlying the skin of the cheeks. Another very common cause is the scratching of the face with dirty finger-nails. This occurs so frequently in

older settled countries, especially in Europe, that facial erysipelas was looked upon as particularly a disease of gardeners; for the soil in the long-inhabited regions is filled with all sorts of bacteria—among them the streptococcus.

The germs cannot break through healthy skin; hence, in order to take the disease from some one else, one must have either an abrasion of the skin permitting the germ to go beneath it, or else one must breathe the germ in against broken or diseased mucous membrane so that it may reach the submucous tissue of the mouth, the tonsils, or the nasal cavities.

The germs lie latent from three to seven days, then the disease begins (if it affect the patient constitutionally) with a chill and fever running up to 103° F., or even up to 105° F., followed in a few hours by the appearance of the reddish spots, showing the location of the trouble. These spots, of course, determine the diagnosis. This fever and the disease in general last on an average two weeks, but it may last for months or be checked in two or three days.

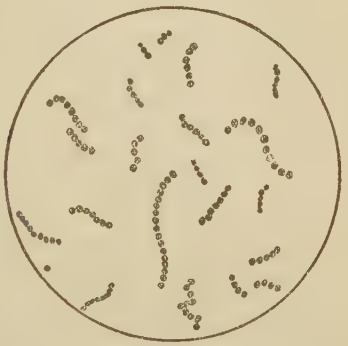

Fig. 14.—Streptococci (Dr. W. K. Trimble).

For patients under forty the mortality is very low; but for those above forty it is increasingly fatal with the years. The average mortality is four to seven per cent. This must, however, be interpreted in the light of the above statement—that the disease in patients above forty is often fatal and for those under forty usually light.

Death is usually brought about by the germs breaking into the blood-stream and reaching the heart, liver,

lungs, and other organs, and there forming colonies which weaken these organs, or by excreting sufficient toxins to poison the entire organism. Again, even in cases which show only slight fever but are very obstinate, where the germs do not get into the blood in great numbers, the disease is fatal because it exhausts the patient with the length of its course of two or three months.

Treatment.—The disease is very contagious, and therefore everything that comes in contact with the patient should be carefully sterilized before being used again by other people. One of the chief dangers of this disease is the very fact that very few people realize this contagiousness and permit the patient to pass freely about the house, handle all sorts of articles, breathe into the faces of the family, and eat at the table with them. None of these things should be permitted. Only one person should take care of the sick person and she should always change her clothing before mingling with the rest of the family. She should bathe her hands in corrosive sublimate solution (1 to 1000) before and after dressing the patient's eruptions or abscesses. There is special danger when women about to be confined have erysipelas; and, in fact, the worst forms of child-bed fever have been traced to cases of erysipelas in the house or under the charge of the nurses or doctors who attended the woman.

In view of what we have said, it is evident that erysipelas should always be put under the care of a physician and his directions carefully followed as to treatment, isolation, and disinfection. If abscesses appear, they should at once be opened and cleansed once or twice a day with the ordinary solution of hydrogen peroxid. In the form which comes from tonsillitis, one should be on the watch for such abscesses in the back of the throat and nose and about the palate. The patient should, of course, be given an antiseptic bath once or twice a day according to the height of the fever. Here, again, it is well to use an oil rub to keep the particles of desquamated

skin and the germs from flying about in the air. The most gratefully received treatment for the disease is the protection of the inflamed surfaces from the access of air. This can be done by rubbing on a thick coat of vaselin or similar substance. In the way of cure there is nothing quite equal to the injection under the patient's skin of antistreptococcic serum.

The diet must be as nourishing as possible. Whether or not it should be fluid depends on the height of the fever and the state of the digestive apparatus. The so-called starvation diet is decidedly out of place, and rich broths, milk, fruit juices, etc., should be served every three hours or as often as the patient can take care of them.

CHAPTER XVI.

BLOOD POISONING.

Blood poisoning is a general term handed down from our forefathers to cover several different conditions which are carefully distinguished by the scientific physician. For instance, in *toxemia* we have the condition of blood poisoning due not to germs but to the toxins excreted by the germs. Thus, in lockjaw (or tetanus) the germs are located in some little insignificant wound, perhaps just under the skin, but the toxins of those germs are absorbed by the blood with a result generally fatal.

Septicemia, on the other hand, is a condition where the germs themselves pass into the blood-current and destroy the vital centers, not only by their toxins but also by their bodily presence. This is the ordinary form of blood poisoning which occurs after an accidental wound by a dirty instrument.

In a case of septicemia, if secondary abscesses have

formed in different parts of the body, the condition is called *pyemia*, and is naturally much more fatal than septicemia itself, because there are so many foci or colonies of the germs that we cannot clean them all out and thus free the body from a renewal of the supply of poison, and the very number of the germs saps the life of the patient. In this condition colonies of the bacteria sometimes grow in the blood-stream itself to such an extent as to clog up the smaller branches. These clots are called thrombi. These masses of bacteria sometimes break loose from the point at which they grew and are carried by the blood-current to the vital organs; as, for instance, to the heart, where they would set up such an obstruction and inflammation that they stop its action; or, again, they may pass to the brain and shut off the blood-supply to some part of the brain, producing apoplexy, or what is popularly termed "a stroke." These floating masses are termed emboli.

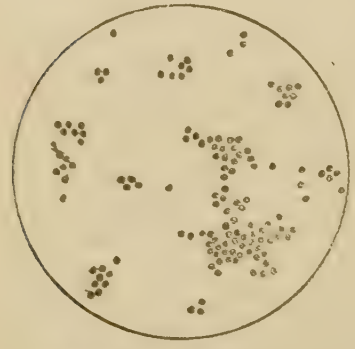

Fig. 15.—Staphylococci (Dr. W. K. Trimble).

Another sort of blood poisoning (*furunculosis*) is that characterized by the formation of boils, carbuncles, furuncles, etc. Some people believe that these are caused by "bad blood"; that is, that they are a form of pyemia. But the truth is that they are more often the result of outside infection—of germs working into the glands of the skin—than of a generally infected blood. The natural antipathy on the part of most people to having these pus collections opened up contributes to the spread of furunculosis, for no better means of propagating bacteria could

be found than these abscesses. It is not only common sense but also a very profitable thing to open up and drain freely as soon as the presence of pus is detected, whether it be in a "boil" or a bruise. After being opened the cavity should be kept cleansed with a good antiseptic.

The fever in toxemia is quite continuous; in septicemia it is usually higher and remittent; and in pyemia it is usually intermittent and accompanied by chills. The duration is, of course, entirely indefinite. The outcome is quite as often bad as good. The blood shows a leuko-

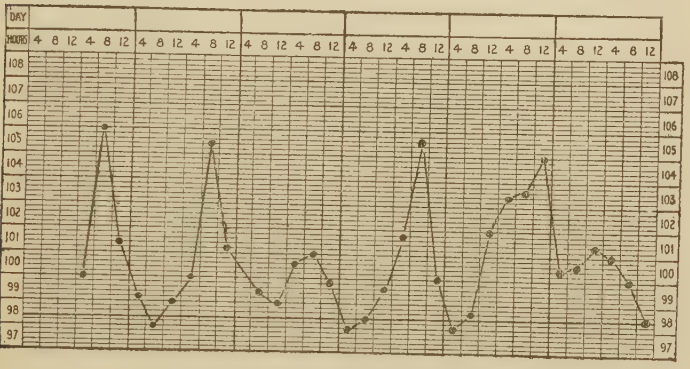

Fig. 16.—Temperature chart of pyemia (Paul)

cytosis. Headache, malaise, and disordered digestion are common to all forms of blood poisoning.

Treatment.—The treatment consists first in securing rest for the patient; second, in seeking the elimination of the poisons through the bowels, skin, and kidneys. (We take it for granted that every accessible focus would be at once cleaned out.) Diarrheas are not checked immediately, but are rather encouraged. Calomel and saline cathartics and high colonic flushings are used to remove from the body all the toxins excreted into the colon. The skin is stimulated by hot packs, hot-air

baths, and brisk massage. The patient is encouraged to drink much water to assist in flushing out the poisons through the kidneys. When any part of the circulation is shut off by a thrombus or an embolus, that part of the body is kept quiet and cold applied locally. Collateral circulation is usually established in a week, but the patient must remain quiet twice that time. All the water used for bathing patients suffering from blood poisoning should be rendered antiseptic with lysol, formalin, corrosive sublimate, or alcohol. Persons suffering from furuncles and carbuncles should be careful to have their clothing thoroughly sterilized. They should not put their soiled clothing into the family wash without a previous boiling.

Really, however, the chief value of a knowledge of blood poisoning finds its application in preventing blood poisoning. Thus, whenever one breaks the skin and gets unprotected flesh in contact with a dirty surface or instrument, immediate attention should be given to cleansing the tissues thus exposed by the broken skin. Peroxid of hydrogen solution injected freely into such a wound will accomplish wonders. Corrosive sublimate solution in a solution of 1 part drug to 1000 parts of water is also useful, and so is potassium permanganate in a still greater solution. Bleeding of these dirty wounds should not be checked until the blood has a chance to wash out and cleanse the wounds. Even then it is very good policy to let running water flow on the cut surface for considerable time. Another very good drug with which to bind up such wounds and abrasions is a liquid made of carbolic acid crystals and gum camphor in equal parts; but in using this latter antiseptic the surface covered should be limited to that exposed by the injury.

CHAPTER XVII.

RHEUMATISM.

Rheumatism is essentially a popular term, and like most popular terms, of indefinite meaning. Under this heading we wish to consider acute arthritis, chronic arthritis, myalgia, arthritis deformans, and septic arthritis.

Acute arthritis is the acute rheumatic fever of some writers. That is, there is a continuous fever of days' or weeks' duration, accompanied by swollen and painful joints. Several joints are usually involved, but those most generally involved are the knees, ankles, and shoulders. The disease is really a constitutional one, as is shown by the headache, malaise, and disordered digestion. The disease is probably of microbic origin. At any rate, the streptococcus pyogenes has been found in the blood of patients suffering from the disease. The general indications point to the tonsils as the port of entrance for the germ—for the disease attacks persons suffering from diseased tonsils oftener than others; and tonsillitis precedes many attacks (at least one-third of the total). The synovial sacs in the joints are the seat of the swelling, and the joint cavities are filled with a clear, non-purulent fluid.

Symptoms.—The fever may begin either suddenly with a chill or gradually after several days of malaise. The pain in the joints and the swelling occur with the fever. The slightest touch or disturbance of the inflamed joints is excruciatingly painful, and the swelling and pain may migrate from joint to joint. The temperature ranges about 102° F., and the pulse is rapid and irregular. The patients sweat freely, in contrast to most fevers, and this sweat is acid and possessed of a sour and foul odor. This

sweating naturally produces miliaria and sudamina from the irritation of the skin. The tongue is coated, appetite lost, and the bowels become constipated. The urine becomes concentrated and scanty. The blood becomes anemic so promptly as to make this a symptom of the disorder.

Death is apt to occur from the involvement of the heart. The arthritis itself, if left untreated, generally becomes subacute or chronic. The anemia shows how vital is the attack on the organism and how liable the patient is to succumb to any intercurrent disorder.

The most frequent complication is endocarditis. This is so often the case that physicians inquire about a history of rheumatism in any case presenting an unexplained valvular lesion. The treatment of this complication requires, of course, the recumbent position and the ice-bag. (See the chapter on "Heart Diseases.")

Pericarditis also develops in the course of rheumatism, but not as often as the valvular lesion. Other complications are meningitis, convulsions, delirium, chorea, nephritis, etc.

Treatment.—The treatment requires absolute rest and the application of heat to the affected joints. This latter is accomplished by means of the hot packs, hot-sand bags, hot-water bags, etc. Salicylic acid in the form of oil of wintergreen and methyl salicylates can be applied locally with good effect. The nurse's work of keeping the local applications hot can be lightened if she can place an incandescent electric light over the bandages. This will generally keep them up to the desired temperature.

The diet has to be liquid, but it must be more nourishing than the diet used in typhoid fever. Therefore, milk, beef broths, etc., are indicated.

The patient's gowns must be of absorbent material, and changed as often as they become moist. The patient should have a cleansing bath twice a day. The temperature baths should be given as needed.

Chronic arthritis is usually without fever, and the symptoms are practically confined to those of an inflammation of the tendon sheaths. There seems to be no formation of pus. The disorder is exceedingly obstinate and uncomfortable. The only successful treatment seems to be institutional, where an individualized diet, massage, baths, and exercises can be given. Even under these circumstances, the course is one of months. The principle of treatment is that of stimulating the metabolism until an entire rebuilding of the body is brought about.

Myalgia is the so-called muscular rheumatism. When in the muscles of the back, it is called lumbago; when in those of the ribs, intercostal neuralgia; when the muscles of the neck are affected, we have torticollis. The disease is probably due to the effect of the accumulation in the muscles of broken down tissues. Therefore, the disease is frequent among those who are lethargic, or whose intake of food is greater than their output of energy. It is also brought about by the chilling of the muscles or similar interference with the regular circulation. It is a painful and obstinate affection. We differentiate it from neuralgia by the tenderness of the muscles, and the fact that there is no pain when the muscles are at rest.

The treatment is evident: the correction of the diet and the giving of hot baths and massage to stimulate the lymphatic circulation in the affected muscles. The diet should be plain, the bowels kept freely open, and all chilling of the body avoided. The attacks are easily overcome, but the avoidance of a recurrence requires a complete change in the habits of life.

Arthritis deformans is a chronic disease characterized by a growing deformity in the smaller joints, usually beginning with those of the wrist and hand. There is no fever. The pain is not as great as that of acute arthritis, nor is the tenderness as marked. Women are more frequently attacked than men, and the age most suscepti-

ble seems to be between thirty and fifty. The cause is unknown. The cause of the deformity is a hypertrophy of the epiphyses of the bones. Osseous proliferations at the joint margins are common and are known as osteophytes; when on the knuckles, they are known as Haygarth's nodosities. Lateral nodules on the distal phalanges are also frequent and are spoken of as Heberden's nodes. The spine may become involved with a resulting stiffness. The joint affection is differentiated from gout by the fact that in the latter sodium urate is deposited in the joints, while in the former it is a bony proliferation. The best that can be hoped from treatment is a cessation of the process. A *restitutio ad integrum* is practically unknown. A long course of hot baths, combined with local massage, and a careful regulation of the metabolism is the proper line of treatment.

Septic arthritis is most frequent in the course of gonorrhea. Here it is usually monarticular in its attack and accompanied by severe fever. The joints attacked become permanently enlarged and limited in their mobility. Endocarditis resulting from such an arthritis is usually suppurative and fatal. The treatment requires all the attention given to the simple acute arthritis plus gonorrheal remedies.

The other diseases producing arthritis are scarlatina, influenza, syphilis, typhoid fever, and similar acute diseases. Arthritis resulting from these, however, is not as obstinate as that of the gonorrheal type, and usually disappears under simple rest and tonic treatment.

CHAPTER XVIII.

TUBERCULOSIS.

Tuberculosis is the new and scientific name for several conditions which have existed for centuries. The name tuberculosis has been given to the general condition, because it describes the form that the disease takes as seen under the microscope; that is, the germs causing the disease gather in small groups or bunches and break down the normal tissue to build up a little mound of cheesy material; and, because of its likeness to a mound, this collection of bacilli and broken-down tissue has always been called a tubercle. Therefore, when Robert Koch, of Germany, discovered in 1882 the bacillus causing this form of tubercles, he named it the tubercle bacillus, and the disease, tuberculosis.

Fig. 17.—The tubercle bacillus (Dr. W. K. Trimble).

The most common disease caused by tuberculosis is the familiar consumption, or "great white plague," as it is now popularly called, which has been causing one out of every seven deaths. This is simply a tuberculosis of the lungs, wherein the lung tissue is changed by the action of the bacilli into caseous material. The caseous material is then either absorbed or expelled through the air-passages and the mouth, leaving holes or caverns in the lungs. When these caverns encroach on blood-vessels, serious hemorrhages occur,

with that alarming symptom—the coughing and spitting of blood.

Tuberculosis also attacks the skin and the tissue underneath it. It is then identical with the disease going under the name of lupus. The skin is raised, reddened, thickened, and changed in character. The breaking down of the tissue sometimes appears at the surface in the form of an ulcer, but the cheesy fragments are always to be found somewhere in the vicinity of the eruption. This is the disease made famous by the work of Professor Finsen in Copenhagen, who cured it (it is very prevalent and obstinate among the peasants of northern Europe) by concentrating upon the affected area violet solar rays.

Another form of tuberculosis is scrofula. This is caused by the tubercle bacilli invading the lymphatic glands, which are found most prominent about the neck, under the arm, and in the groin, causing them to swell and break down into the familiar cheesy product characteristic of tuberculosis. Sometimes this broken-down material is discharged through the skin as pus. This disease gradually extends from one gland to another and finally reaches the lungs and other vital organs with a generally fatal result. It is a disease characteristic of poor hygienic conditions.

Practically every organ in the body may be attacked by tuberculosis; for instance, the covering membranes of the brain may be attacked, and we have tubercular meningitis; the intestines may be attacked, and we have those cases of prolonged suffering from pain, indigestion, and emaciation, which excite every one's sympathy, but which, as ordinarily found, are beyond treatment. There is also tuberculosis of the peritoneum—tubercular peritonitis—which is sometimes quite curable. The sexual organs may be attacked by tuberculosis, and unless the malady is discovered very early become incurably diseased.

Tuberculosis of the bones is responsible for those pitiful

cases of hip-joint disease seen so frequently in children. Generally, the parents claim that the disease is caused by a fall, but since the results are out of all proportion to the slight accident we are justified in believing that bad hygiene for several preceding years is usually responsible for the disease. Again, the ordinary cases of diseases of the spine (Pott's disease) are nothing else than tuberculosis; and, finally, tuberculosis very frequently attacks the joints and causes such destruction of the tissue that even with the best treatment a usable joint is impossible. Bone tuberculosis usually produces what used to be known as cold abscesses; and, when we find deep-seated abscesses discharging pus at irregular intervals through long sinuses and which have no pain or fever, we are justified in suspecting tuberculosis.

When the tubercle bacilli get into the blood in any great number, they cause what is known as acute miliary tuberculosis. This disease runs a course like typhoid fever, but ends ordinarily in death at the end of four to twelve weeks. The differential diagnosis is very difficult. There is, however, usually a rapid and weak pulse instead of a slow one. The Widal reaction is, of course, absent.

The study of the pathologic anatomy of tuberculosis and the discovery of its causation form an epoch in the history of medicine; and it is very interesting to note that away back in 1852 a French physician, Lavaine, asserted that tuberculosis could be transmitted; then, in 1864 this same physician in connection with other men proved it to be distinctly infectious, but he could not isolate the bacillus itself and therefore failed to prove completely his thesis. This was done by Koch, two decades later. The bacillus is a delicate one, easily killed, and one which cannot gain headway in the healthy human body. That is, in order to become consumptive, one must have something else present than the germ. This something is usually exhaustion due to overwork

or bad hygiene or a severe illness. The germs, however, can be dried and remain viable for two years. Therefore the dust with which the sputum of tubercular patients, who expectorate on the streets and on the floor, becomes mixed is a very good medium for keeping these germs alive and carrying them to other people who may be ready to take the disease.

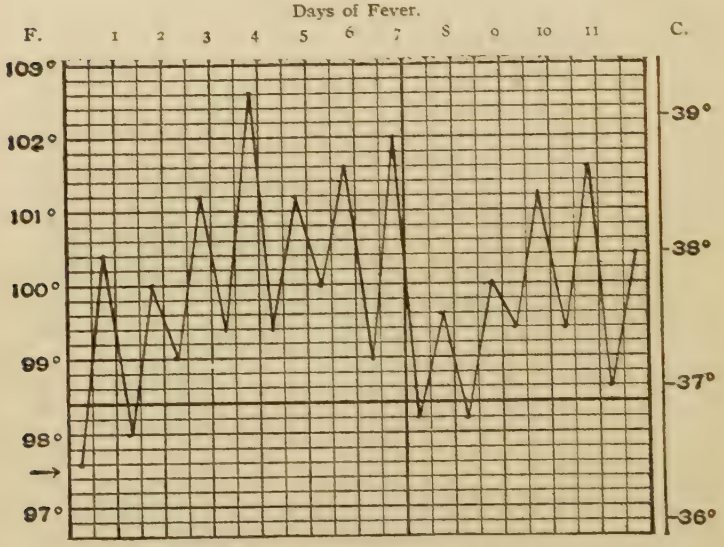

Fig. 18.—Hectic fever in consumption (Sahli).

Unfortunately, tuberculosis does not produce in the body an antitoxin which would inhibit the germ, as do pneumonia, typhoid fever, and the other infectious diseases. In other words, it is not a self-limited disease. For this reason tuberculosis, if neglected, becomes worse; while many of the ordinary fevers, even if let alone, terminate favorably. This makes necessary very prompt and vigorous treatment, which must be instituted at the

very beginning of the trouble. For, if tuberculosis can be discovered early enough, it is decidedly curable. Its successful treatment depends on just one factor, and that is the making of the body attacked by the disease absolutely healthy. This is accomplished by regulating the diet and exercise—by having the patient eat an extra amount of fats and proteids, by seeing to it that he gets the requisite amount of fresh air and sunshine.

Consumption usually begins with a slight hacking cough, a loss of appetite, or at least a capricious one, and a loss in weight. The physician, of course, can ascertain the presence of the disease by a careful examination of the lungs to note if the character of the respiration is changed, if the pulse is increased in rapidity, and by using his microscope to see if the bacilli can be found in the sputum. If we do find the bacilli in the sputum, we of course know that the patient has tuberculosis; if we do not find the bacilli, it is not positive proof that he has not the disease. Further on in the disease there is a daily fever; that is, the morning temperature is normal and the afternoon temperature up to 100° or 101° F. People with this fever usually have a hectic flush on the cheek and a bright eye with a dilated pupil.

It has often been said that consumption is inherited. It is inherited only in the sense that the body of the offspring of tubercular parents is weakened and more susceptible to the disease than are other people; secondly, babies born in tubercular families quite often are infected by the disease during their infancy and childhood. Such children frequently have tuberculosis of the bones or internal organs, and if they grow up at all do so as very delicate men and women.

Treatment.—The first thing to do when a member of the family is found to have tuberculosis of the lungs is to have that person sleep alone. The second thing is to prevent his spitting anywhere except in a receptacle containing antiseptics or in a cloth or napkin which can be

immediately burned. The disease is very infectious, and must be treated by a certain amount of isolation. The cure of the patient is impossible unless he has the freshest of air in his sleeping room as well as during the day, and also a regulation of diet; and it is equally impossible to prevent the spreading of the disease if every one associating with the patient does not see to it that his clothing, his hair and whiskers, and all things connected with him are not permitted to carry the infection.

As far as the diet is concerned, there are three staples which must be pushed in large quantities; viz., eggs, milk, and steak. Inasmuch as the digestion of all consumptives is impaired, it is necessary to have medical attention in the regulation of the diet and in stimulating the appetite. All that we can say in general terms is that the patient should eat about five times a day and take as much of one or the other of these three staples as possible. Perhaps the best general rule is that the patient should take after each meal one, two, or three raw eggs until he comes up to eighteen or twenty-four eggs a day.

In the treatment of consumption the best thing to do is to go to a sunny, equable climate and live in a tent with excellent food and excellent medical attention for several months at least. This is, of course, very expensive—at least $100.00 a month being necessary for such sanitarium treatment. When the patient cannot afford this, he should arrange to live in a tent in a place where the air is clear and the sunshine is strong. If he has fever, he should not exercise or work at all. Next, he should have a bath in cold water every morning—given best with vigorous rubbing. Then he should have a diet as outlined above. In other words, the patient should lie in a reclining chair, wrapped up warm, all day. He should sleep in a tent at night, and seek in every way to strengthen his body. The worst way of treating consumption is to let the patient live at home and go on with the same

routine of life to which he has been accustomed. Consumption can be cured, but it cannot be cured by simply taking medicine, or by lowering the window of the sleeping room a little further, or by lolling about the house, keeping close to a warm fire. Such conduct violates every law governing the treatment of tuberculosis, and cannot be too strongly condemned.

When the patient cannot possibly live in a tent, the sleeping in fresh air can be accomplished by having a window tent. This tent extends from the window over the patient's bed so that the patient sleeps practically out of doors; and the atmosphere of the room is simply freshened by having the tent in the room. It solves the problem for city dwellers.*

Surgical tuberculosis, as tubercular abscesses and tuberculosis of the bones are called, must be treated by cleaning out the tubercular foci by the use of the knife, and then subjecting the patient to the regular consumptive's régime. It is a mistake to try to cure these forms of tuberculosis without the fundamental operative cleaning out. The curetting and drainage of these abscesses requires much persistence; and if left to the nurse she must remember that the only line of safety is through free incisions and copious flushings. For the latter purpose iodin and its preparations seem in best repute. Thus, a 10 per cent. glycerin emulsion of iodoform is injected into a tubercular cavity and allowed to drain out slowly through the incision.

*The tent is made by the Kny-Scheerer Company of New York, from whom descriptions and prices may be obtained. It was designed by Dr. S. A. Knopf of New York.

CHAPTER XIX.

THE INTOXICATIONS.

Alcoholism and the Drug Habits.

The narcotic drugs are those which stupefy the higher centers of the brain and leave for a time at least the lower centers without the supervision of conscience and circumspection. For instance, cocain takes away all sense of fatigue, and lets the motor influences run riot. Alcohol removes all sense of shame and reserve and gives one the feeling of being able to do great things. Morphin leads one to forget the actual and dream dreams and see visions. Hence, the narcotics are in demand among all those who depending for happiness on outside things are necessarily constantly meeting with disappointment. The action of these drugs which makes their use of interest to the physician rather than the priest is that they are habit-forming drugs, and gradually weaken the body as well as the mind.

Alcoholism.—It takes only 15 c.c. of alcohol to affect the brain and render it inaccurate in observation and thought. This amount is found in less than a pint of 4 per cent. beer, in about three ounces of the ordinary red wine, and in less than half that amount of port wine. Of whiskey, an ounce would easily show its effect on an average normal brain. The effect of alcohol does not pass off from the brain for some forty-eight hours. Hence, small amounts of alcohol taken daily produce a permanent weakening of the activity of the finer centers, and the individual is unfitted to pass judgment on matters calling for the exercise of a fine moral sense. After a time the steady use of alcohol influences the coarser fibers of the nervous system, and we find the user subject to acute insanity (delirium tremens, mania a potû), and also to affections of

the digestive and circulatory organs. The stomach is in a state of chronic inflammation with a hypersecretion of mucus; the kidneys suffer from interstitial nephritis; the heart suffers the flabby enlargement called ox-heart; and the lungs are subject to bronchitis and apical pneumonia.

Treatment.—When a man has reached this stage, the cure of the condition is no easy matter; for many of the body-cells have been destroyed and their place taken by simple connective tissue. If a cure is to be effected at all, the treatment must continue for a long time and under conditions wherein the patient is not called upon to bear much of the responsibility. Even for patients who have not reached the stage of delirium tremens the cure of the habit of depending upon alcohol beverages for their sense of well-being cannot be accomplished in three days. Six months at the least should elapse before the patient is subjected to his old temptations, because it is a matter of forming new association fibers in the brain—of forming new habits and ideals. For these reasons the cure of the alcohol habit should be carried out in an institution, away from home and under new influences.

The cure itself, as now practised, consists in withdrawing at once the alcohol and then using other stimulants to keep up the patient's strength until the good food and rest start the rebuilding of the body on a healthy basis. Thus, every morning the patient should be given heavy doses of Rochelle or Epsom salts, he should be given food and water every two hours, followed for a few days at least by digestants and nux vomica, or other gastric stimulant. Naturally, the patient should be in bed or on a couch most of the day until his weight begins to increase steadily. Here, again, baths and sprays and massage are very helpful in calming the mind and in building up the body.

The *morphin habit* requires similar treatment, for the patient is in similar mental condition. As far as the

physical condition is concerned, there is less liability to fatty degeneration of the liver and heart, but the body as a whole is more emaciated, the skin is dry and coarse, and the response to treatment less prompt. The morphin habit is peculiarly destructive of the moral fiber of its victim and he rarely can tell the truth—even when it would be to his advantage to do so.

The treatment for the *cocain habit* resembles the two preceding, being different only in the particular drug used by the physician to keep the patient subdued while suffering from the removal of the cocain.

Thus, as far as the physician and nurse are concerned, the drug habits are chronic intoxications which have affected more especially the nervous system. The duty of the medical treatment is to prevent the patient from being further poisoned by the particular drug from which he is suffering, to eliminate the poison already stored up in the system (and there is much of it), and to regenerate, as far as possible, the tissue damaged by the disease.

The growing fear of pain and the wrong ideals of life are largely responsible for the increase in drug habitués. There is need of inculcating in children greater hardihood and the ideal of serving than of being served, if we would do something toward stemming the tide of narcotism.

Ptomain Poisoning.

There are two distinct causes of poisoning from food stuffs. The one is the bacteria actually contained in the food, and the other is the ptomain already generated in the food stuffs. The first, of course, acts as a bacterial infection only after an incubation period of one or more days. The second sets up its symptoms almost as soon as ingested, and may cause death in three to five hours. It is not always necessary for the ptomains to be preformed in the food; they may be produced in the stomach of the victim by the continued putrefaction of the food under

the influence of the stomach warmth and digestive juices. Hence it is not always possible to tell from the appearance of meats whether or not they are poisonous; one must know something of the history of the animal from which they came. For these reasons cooking thoroughly is always necessary, especially in case of sausages, meat pies, etc.

The intoxications from food are characterized by the fact that in them all the gastro-intestinal tract and the nervous system suffer most. There is usually vomiting, retching, colic, purging (or obstinate constipation). The participation of the nervous system is shown by the disorders of sight (double vision, ptosis, etc.) and glosso-pharyngeal paralysis. The temperature may be normal, subnormal, or elevated. The heart is more regularly affected—the pulse being rapid and weak.

The bacterial poisonings from meat take the form of a violent enteritis—in many cases like the para-typhoid fever, which resembles typhoid fever but does not give the Widal reaction. They must, therefore, be treated by carefully cleansing the bowel, allowing little or no food for a day or two, and then by stimulants (hypodermically) and warmth keep the patient alive until the bacterial invasion be overcome.

As an example of acute intoxication from the ingestion of bacteria, we quote the following case from Harrington's Hygiene:

"A remarkable outbreak due to raw pickled ham has been recorded by Van Ermengem and carefully investigated by himself and others. More than twenty members of a musical society at Ellezelles, in Belgium, were seized with serious illness after eating the greater part of a raw pickled ham; three died within a week and ten lay in a critical condition. Other parts of the animal from the same pickling tub were eaten in a raw state without ill effects, and pieces of the particular ham had been consumed a short time before, also without ill effects. Only those persons who ate of the ham were seized with the very peculiar train of symptoms recorded. Most of them were seized in from twenty to twenty-four hours, two in less than that time, and a few as late as thirty-six hours after eating.

"The first symptoms were gastric pain, nausea, and vomiting of

undigested food and gelatinous blackish matters. Instead of diarrhea, which one would expect, there was obstinate constipation in all but two cases, and the first dejections, with or without cathartics, were black and viscid. In every case, in from thirty-six to forty-eight hours, there were profound disturbances of vision—amphodiplopia, marked dilatation of the pupils, with absence of reaction to light, ptosis of both lids, and a peculiar fixed stare. There was burning thirst with a strangling sensation in the throat. Swallowing, even of liquids, was difficult or impossible, and every attempt was accompanied by choking.

"In some instances, the saliva was suppressed and the mucous membrane dry and glossy. The voice was weak, and with some there was total aphonia. Dysuria and anuria were common. There was but little disturbance of respiration and circulation: the pulse never reached over 90, respiration was quiet, temperature normal. Consciousness and general sensibility remained unimpaired throughout, except in the fatal cases, in which alone, several hours before death, there occurred collapse, dyspnea, small irregular pulse, light delirium and coma.

"There was obstinate insomnia in many, during the first period. The extremities and trunk muscles showed neither complete paralysis nor atrophy, but there was great general muscular weakness, and slight movements caused extreme fatigue. After two or three weeks, the eye symptoms began to improve. The dilated pupils contracted, the cloudiness disappeared, and the half-paralyzed eyelids regained their power. Diplopia disappeared only when both eyes were fixed laterally. Paralysis of accommodation lasted a long time after the disappearance of all the other symptoms, and normal vision did not return until after six to eight months.

"Autopsy in two cases showed no characteristic changes in the organs, only extensive hyperemia of the kidneys, liver and meninges, and softening and unusual friability of the stomach walls. In one, the liver showed marked degeneration, and the brain punctiform hemorrhages. Neither the liver nor kidneys showed anything unusual on bacteriologic examination, but the spleen yielded an anaërobic bacillus, which proved later to be capable of causing botulism.

"The pig from which the ham came was killed some months previously, and what was not eaten at once was pickled in the usual way. During the time that elapsed between the pickling and the supper, the greater part of the animal had been consumed without causing any sickness, but the ham which was nearly intact was the last to be eaten, lay on the bottom of the tub, and was the only part that was immersed completely in the weakened brine. What was left of it gave no odor of putridity, but had a distinct odor like that of rancid butter. That the ham had a bad taste was agreed by nearly all who ate of it. It appeared normal to the eye, but was pale, like any meat that has been soaked some time in water. There was no evidence of decomposition, and no ptomaines were detected.

"Bacteriologic examination proved in different parts the presence of a hitherto unknown spore-bearing bacillus in great abundance, the same organism as that isolated from the spleen of one of the victims.

It produced an extraordinarily virulent toxin, which was isolated by Brieger from cultures supplied by the discoverer, by whom the organism was named Bacillus botulinus. The toxin is rendered inert by a temperature of 60° to 70° Centigrade, therein agreeing with other bacterial toxins thus far isolated.

"Attempts to discover the organism in the feces of various animals and in filth of various kinds, and in specimens from where the pig was raised were negative in results.

"Feeding-experiments, conducted on various kinds of animals with the meat itself and with aqueous triturations of it added to other foods, produced, as a rule, fatal results with the same train of symptoms as above mentioned. Subcutaneous injections of the watery extract produced the same results as the feeding-experiments. The aqueous extract kept in the dark in a sealed tube retained its properties unimpaired for ten months, and small pieces of the meat kept in cotton-stoppered tubes without special precautions retained their virulence even longer. The poison resists the effects of putrefaction, and proved to be equally poisonous after four days' standing in a mixture with feces, decomposing blood and urine, and filtration through porcelain. A fresh filtrate, to which were added B. prodigiosus, B. proteus liquefaciens, B. fluorescens putrides, and B. coli, was found at the end of a week to be as active as ever."

Unlike the intoxications due to narcotic drugs, ptomain poisoning is usually acute and unexpected. The symptoms are, in general, great prostration, severe abdominal pain, chills, rapid pulse, and the other symptoms of a general intoxication. As an example of the intoxication produced by ptomains and bacterial toxins, we quote the following case, also from Harrington:

"Poisoning by canned corn beef at Sheffield, reported by W. N. Parker. On October 11, 1899, a six-pound tin of corned beef was opened, and about two-thirds were sold, chiefly in quarter pounds. Beyond the fact that the meat seemed less solid than usual and the jelly rather oily, nothing unusual was noticed. It had no odor, its taste was normal, though quite salt, and but one customer found its flavor disagreeable. So far as is known, none who ate escaped; twenty-four persons, ranging in age from two to eighty-nine years, were affected. The following serves as an example, though each case presented one or more symptoms peculiar to itself.

"A woman of thirty-five ate two ounces of the meat at 12.30, and in two hours was seized with faintness, dizziness, and drowsiness, followed by nausea, and great muscular weakness, especially of the legs. Persistent vomiting with frequent retching soon occurred, accompanied by intense frontal headache, and followed by colic which was not relieved by purging. One hour after seizure, she was taken to the hospital, where she lay on a couch in a state of collapse

with her knees drawn up. Her face was pale, with livid patches around the eyes, and bathed in perspiration. The skin was cold and clammy, the pulse small and rapid, the respiration shallow, the temperature subnormal, and the pupils dilated. Her stomach was washed out, and in a short time, the pain and retching ceased, the character of the pulse improved, drowsiness was diminished and only the headache and purging remained. Within an hour the condition of collapse and other symptoms reappeared, but with less severity. The stomach was again washed out, and this time, the good effects were permanent. On the following morning, all that was complained of was slight frontal headache.

"The approximate latent period varied between one and three and one-half hours, but in only two cases was it more than two and one-half hours. Frontal headache was present in all but four, vomiting in all but one, pain in only twelve, marked collapse in twelve, profuse discharges in all but six. The initial symptoms were the same in all; that is, drowsiness or giddiness or both.

"Only one case resulted fatally, that of a boy of seven years old, who ate two ounces. His symptoms were especially severe; collapse was very marked and he required constant stimulation. About ten hours after the onset, he had a series of clonic contractions of the flexor muscles of the neck, arms, and legs. The movements were violent, rapid and almost rhythmical, commencing first in the neck and arms, but soon affecting the legs. The eyes were fixed and staring and the pupils widely dilated. After lasting an hour and a half, the convulsions ceased. They reappeared in half an hour, affecting first the right arm and right side of the face, but soon became general. The collapse gradually deepened, and the boy died fifteen hours after seizure. Autopsy showed nothing more than a general hyperemia of the stomach and intestines, with a few hemorrhagic erosions in the gastric mucous membrane. A microscopic examination of the kidney showed cloudy swelling of the cortex, with a few scattered hemorrhages.

"All the other victims convalesced rapidly and were discharged from the hospital within 48 hours. Stimulants, chiefly in the form of strychnine and brandy, were administered freely. The meat was examined bacteriologically about 11 hours after the tin was said to have been opened. In the outer parts of the meat, many organisms were found. The only organism present both in cultures from the center of the meat and in those from the surface was the bacillus of Gaertner."

Ptomains are "the basic compounds resembling the alkaloids, formed by the action of bacteria on animal and vegetable tissue" (Gould). Some of these are toxic, more so even than strychnin and the other poisons with which we are familiar. Others appear to have little or no toxicity.

Ergotism is the form of intoxication due to the eating of rye spoiled by ergot (claviceps purpurea). This occurs usually in those years when on account of wet weather the crop is light and the people who are dependent upon rye for their bread have nothing but this grain spoiled by the fungus to use. Hence, the disease is most frequent among the peasantry of European countries, but it has appeared also in America. Here, in contradistinction to the onset in other forms of ptomain poisoning, the symptoms do not appear until the spoiled grain has been used for some weeks. The symptoms are increasing emaciation, nervous tremors and pains, and finally gangrene of the extremities. The treatment is, of course, to give the patients highly nutritious food, rest in bed, and massage and baths to the affected parts of the body.

Mytilotoxism results from the eating of spoiled mussels. The first symptom is the rash, like that of scarlet fever, which may be followed by convulsions and even death. The treatment is to empty the stomach and bowels, promote elimination by way of the skin and kidneys by the use of hot packs, and stimulate the patient until nature can reassert herself.

Ichthyotoxism is the name applied to poisoning from eating spoiled fish. The pupils are dilated. There is violent pain, especially in the epigastrium, and a rash finally appears. The same general line of treatment applies.

Kreotism results from eating unfit meats; most frequently sausages, meat pies, and mincemeat, because into these concoctions meat unfit for inspection and sale is usually tucked away. The symptoms are similar. Here, again, very active catharsis with stimulation by coffee and hypodermic injections is indicated. The patient is generally so weakened by such an attack that days of convalescence are necessary.

Tyrotoxism refers to the poisoning following the ingestion of tyrotoxicon, the ptomain from milk, ice-cream,

cheese, etc. This has seemed to be on the increase and has been one of the factors leading to the demand for pure food legislation. The symptoms are the same—pain, vomiting, prostration.

Neuritis is apt to result from a severe attack of ptomain poisoning. Therefore, the after-care should be close and protective.

Sunstroke.

Great heat with great humidity are apt to produce the condition known as heat exhaustion, sunstroke, thermic fever, insolation, and siriasis. Physical exhaustion, hunger and thirst, weakness of heart or kidneys, and alcoholism are predisposing factors. The symptoms are vertigo and oppression, followed by coma with or without convulsions. The face is livid and cyanotic, the breathing is stertorous, the pupils are fixed (they may be either contracted or dilated). The fever is apt to reach even 112° F. in sunstroke, while in heat exhaustion the temperature is subnormal and there is sweating and collapse. Sunstroke may produce death in a few hours. Relapse is common, and the sequelæ of discomfort when exposed to warmth may last for years.

Treatment.—The treatment is to lay the patient flat in the open air, and, if possible, turn a gentle stream of cold water over him. When this is not available, ice-packs to the head and spine are useful. Stimulation with strychnin, etc., must be given. If the patient survive, the after-care is important. The patient should be kept quiet and fed a careful diet for days and must not expose himself to heat or overstrain for several months—for his susceptibility is greater than at first.

CHAPTER XX.

COUGHS AND COLDS.

The nurse even more than the physician has the opportunity to instil into the minds of the members of the families in which she is employed the principles of preventive medicine. She can, therefore, if she be observant of her opportunities, do much toward educating the public in medicine and toward promoting the public health. In no one particular can she accomplish more good than by teaching the people to breathe pure air, to breathe deeply, and to invigorate the skin by the use of daily cold-water baths. For this would prevent the greater part of the coughs and colds now afflicting the average American family.

The ordinary cold is due to a congestion of the blood in the mucous membrane of the nose and throat. This congestion is often induced by inhaling the fumes of some irritating gas, such as bromin. It may be induced by the reaction from a local chill to these surfaces, such as is obtained by being exposed to a draft of cold air. It may also be caused by the irritation of dust and smoke. Finally, it may be caused directly by bacterial infection. Of course, even if the original cause be mechanical or physical, nevertheless the congestion results very soon in an infection, because the membranes of the nose and throat are always covered with bacteria deposited by the air passing to the lungs; and these bacteria need only the opportunity presented by the weakening of the bactericidal power of the membrane caused by the congestion to become active.

This congestion is simply the distention of the capillaries of the nose with blood. But, in tissues so vascular as those of the nose, such a dilatation of the capillaries fills

up the nasal passage with turgid mucous membrane and the patient cannot breathe through the nostrils. This congestion also causes the glands in the membranes of the nose to swell and discharge a watery mucus. When the bacteria become active, this discharge becomes more or less purulent.

If the turgescence does not at once subside, the congestion becomes an inflammation, more or less bacterial in character, and spreads along the mucous membranes downward into the pharynx and throat. This means the development of a "sore throat." The same process upward instead of downward leads to an inflammation of the bony cavities connected with the nose: the antrum of Highmore, the frontal sinus, and the sphenoidal cavities. This "sinusitis" causes a persistent neuralgia as its chief symptom. The inflammation may even pass into the Eustachian tube, and then into the middle ear.

The *prophylaxis* of colds is then to keep the skin and mucous membranes healthy so that when a congestion occurs, the membranes quickly recover their balance. This healthy condition of the nasal membranes is secured by sleeping at night with the windows open, by bathing the skin daily in cold water, rather than by tonics and medicines.

When a cold has once begun, by washing out the nasal passage by some soothing and antiseptic spray or solution, one can sometimes check the development of more than a temporary inconvenience. After cleansing the nose thoroughly, the sufferer should go to bed, or take some equally effective means of obtaining quiet for the nasal membranes.

Sore Throat.—A cold may, of course, begin in the throat without having extended down from the nose. This usually takes its beginning in a diseased tonsil. They are even more liable to infection than are the nasal membranes, and are therefore the starting point for many general diseases. From the pharynx the inflammation

usually extends downward to the larynx, and we have both sore throat and cough. This cough is nature's effort to throw off the irritating substance from the respiratory passage. The hoarseness is due to the swelling of the finely stretched vocal cords; a swelling that makes their edges thick and soft. If the infection causing the inflammation be not particularly virulent, the inflammation will subside in a few days if the cords are given rest. This cure is hastened if one causes a hyperemia of the throat by applying moist hot bandages to the outside of the neck from the jaw to the collar bone. To do this, take a strip of coarse cloth four inches wide and six feet long. Moisten one end in water, and wrap that end first around the neck from the root of the neck to the ears, wrapping the dry end around over the moist portion. This keeps the bandage moist and the heat of the body keeps it warm. This should stay on all night or for at least six hours at a time.

When the inflammation continues downward still farther, we have a **tracheitis** (rather unusual) and finally a **bronchitis.** This latter is the more to be feared because it may lead to a broncho-pneumonia, to an emphysema, or to a bronchiectasis. The bronchial tubes in bronchitis are more or less filled with the muco-purulent secretion from their lining membrane, the breathing is difficult, and the cough racking and incessant.

The result of a long-continued cough and "hawking" from a chronic bronchitis is the straining and consequent overdistention of the bronchioles and air-vesicles. This produces emphysema. In this disease the chest remains in the position of full inspiration, because the alveoli having lost their elasticity cannot expel their air. Hence the patient has to breathe by means of the accessory muscles and the diaphragm—that is, straight up and down. We can recognize such patients by their barrel-shaped chest and the cyanosis, besides the more accurate symptoms elicited by palpation, percussion, and ausculta-

tion. The patient suffers all the paroxysms of asthma and similar troubles. Another frequent result of chronic bronchitis is bronchiectasis—or, the ensacculation and breaking down of the wall of the bronchioles. In these sacs, great masses of pus accumulate to be discharged about twice a day by paroxysmal coughing. In emphysema, the cough is more frequent, but also paroxysmal.

The *care* of a person suffering from bronchitis requires

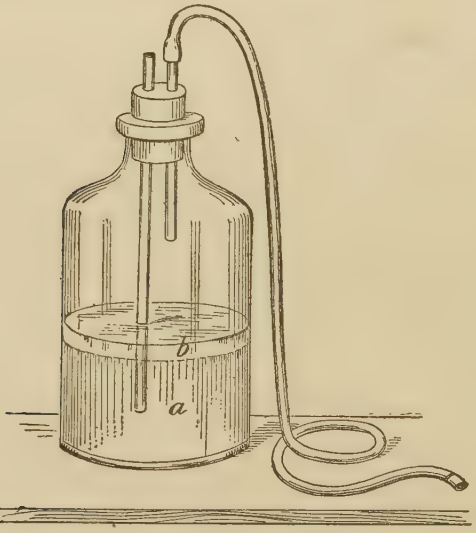

Fig. 19.—The "turpentine pipe." *a*, water; *b*, turpentine.

the making of the air of the room moist with the vapor from boiling water in which enough eucalyptol or turpentine (as the doctor may prescribe) has been poured to render its fumes distinctly noticeable. A bronchitis tent will be found useful for giving the patient such inhalations. It may be improvised by building a canopy over the bed with the top some three feet above the patient. The framework may be sticks (broomsticks) and the fabric,

ordinary sheets. Three sides of such a tent should be closed. The vapor is generated outside the tent and transmitted by a pipe or rubber tube. When the patient is up and about a turpentine pipe (see Fig. 19) will be found very effective. He should suck the turpentine-laden air up through the tube for five minutes at a time, several times a day. Next, the air of the sick-room must be cool and fresh. This can be obtained from an open window over which is fastened a stout coarse cloth to prevent a draft. Hot and cold fomentations to the chest and back will assist in carrying off the products of the inflammation. The cough is best treated with heroin or some similar drug (prescribed by the attending physician).

Soothing sprays for the throat in these disorders are made of one or two per cent. solutions of menthol and thymol in refined petroleum.

It always assists in the establishment of a better circulation to have a good mineral water or cathartic salt given at the beginning of the trouble, and usually also (in smaller dose) every morning.

CHAPTER XXI.

STOMATITIS.

One of the most important duties of the nurse is to keep the mouth and teeth of the patient clean. This is, of course, particularly true in those cases where calomel, iron, or the iodids are being given; but even in cases of ordinary sickness the condition of the patient's mouth determines largely his comfort. Furthermore, the tonsils are probably the most used port of entry for disease; they need, therefore, special attention when we are attempting to protect a person from the attack of additional disease. Whenever they seem at all suspicious,

the nurse should cleanse the throat and tonsils with a gauze swab saturated with the peroxid of hydrogen. The tonsil at the base of the tongue, usually entirely untouched by the ordinary cleaning, is accused by some good surgeons of being responsible for tuberculosis of the cervical glands; hence, this part of the mouth should not be overlooked. This gauze swabbing should be followed by the gargle of some good antiseptic.

In brushing the teeth the nurse should brush both ways; that is, both with the grain of the tooth and across the gums. The real object of cleaning the teeth is not so much their polishing as it is to free their crevices and corners about the jaws from bits of food, which if left, might decay and set up chemical erosion.

If the patient becomes *insalivated*, the nurse should cleanse the mouth several times a day with solutions of peroxid of hydrogen, in alternation with those of potassium chlorate.

"Cold sores" (*aphthous stomatitis*) and minute *ulcers* should be touched with a pledget of cotton saturated with full strength of grain alcohol. When this is not sufficient, they should be touched, after drying with absorbent cotton, with the caustic stick (nitrate of silver). If this be not at hand, a crystal of zinc sulfocarbolate, or a pledget saturated with carbolic acid (full strength) may be used. Alcohol is always to be applied to the tissues after carbolic acid.

If there is suspicion that the eruptions are due to *thrush* or ulcerative stomatitis, carbolic acid followed by alcohol should be used from the start. This should be done several times a day until the ulcers cease to spread. In giving such treatment to a patient not under perfect control, the nurse should have everything ready at hand before she begins and then should use a roll of gauze to keep the mouth open and to protect the throat while she is at work. Some patients will involuntarily bite down on the nurse's fingers unless she be on her guard. The

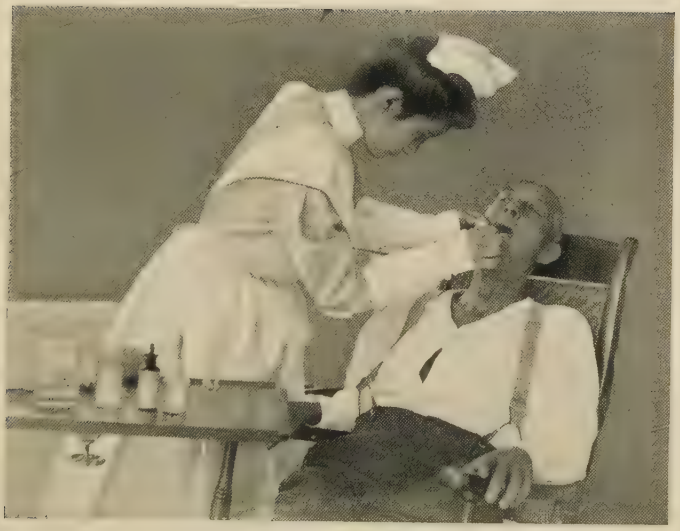

Fig. 20.—Touching ulcers of the mouth. The left forefinger is protected by a thick roll of gauze.

alcohol following the carbolic acid is to neutralize it and prevent its spreading with its caustic effects into the healthy part of the mouth. Thrush is caused by a fungus, the oïdium albicans, and attacks chiefly weakly children. Naturally, it can be transmitted from person to person, and therefore requires some precautions to prevent transmission.

Ulcerative stomatitis is usually caused by a mixed infection of pus-forming and virulent microbes. Everything, therefore, coming in contact with such a patient should be disinfected. The nurse in particular should not go to the next patient without thoroughly disinfecting her hands and arms. The treatment requires the cleansing of the infected spots either with a cautery, a curet, or the carbolic acid mentioned above.

CHAPTER XXII.

DISORDERS OF INFANCY AND CHILDHOOD.

Disorders of infancy are in general those attendant upon the rapid growth of the organism. In other words, they are disorders due to malnutrition. So much depends in the case of children upon the digestion and absorption of every bit of the food given them that even what in the adult would render the patient uncomfortable but not sick, affects materially the growth and development of the child.

Inasmuch as the child's stomach and intestine are very susceptible to infection, many infants perished from acute intestinal infection until we learned to sterilize their food. This was notably the case during hot weather when milk, as ordinarily cared for, is an excellent culture medium, teeming with millions of bacteria. In

order to avoid this infection and spoiling of the milk, milk intended for babies' use should be put on ice as soon as drawn from the cow and then kept on ice, in sterile bottles, until it is time to feed the baby. In other words, its temperature must never rise higher than 45° F. The milkmen of our cities need close supervision to prevent them from adding formaldehyd to the milk to keep it from souring, and from adding water to increase the bulk, and from selling off the cream before they sell the milk. Hence we cannot expect them of their own volition to pay any attention to the added matter of using sterile bottles and keeping these bottles on ice. Nothing but special supervision and special pay can accomplish this. Hence it is well for nurses to seek out for their charges some honest and enlightened dairyman who will for a reasonable consideration keep his cows and his stable clean, boil his pails and his bottles, and keep the milk on ice until delivered to the consumer.

If, now, the milk is boiled, it sterilizes it truly, but it so changes it that it may prove indigestible to the infant, or cause scurvy or similar disorders of metabolism. To sterilize a milk, therefore, and yet keep it fit for the use of a baby is no easy task. The nearest approach to the accomplishment of the task is found if the nurse use a thermometer and carefully heat the milk to 158° F., and keep it at that temperature for ten minutes, and then put it on ice. This, of course, inhibits but does not destroy all the germs and their spores and is usually only sufficient to prevent the setting up of fermentation in the child's stomach. But, after all, it is far better to have the milk certified as coming from healthy cows (free, in particular, from tuberculosis), kept clean, and milked in a clean stable; and as having been put at once into sterile vessels and kept below 45° F. until delivered to the consumer.

Cows' milk differs from mothers' milk chiefly in containing less sugar and more proteid, while the fats and

Fig. 21.—Holding a baby for the doctor to examine.

salts are practically the same. For the very young child, therefore, the milk from cows must be diluted at least one-half, and sugar and fat (cream) added. The older the child, the nearer an average cow's milk can he take.

The quantity to be fed an infant varies from a quarter ounce in a newly born premature child to ten ounces in a vigorous three months' child. The number of feedings range during the same time from eighteen to five in twenty-four hours.

Scurvy.—If the baby has been fed on patent and sterilized foods, the chief disorder to which he is liable is scurvy (scorbutus). This is the disease that used to prevail on ship board and in prisons where no fresh food was to be had. Now, of course, thanks to our methods of cold storage, it is practically confined to infants under charge of persons too lazy to prepare the right food, or too fearful of infection to use anything except sterilized foods. In this disease, the gums are spongy and bleeding, purpuric spots appear on the skin, and the periosteum (of the femur, especially) becomes swollen, tense, and tender. This last symptom is due to subperiosteal extravasation of blood. The child lies crouched and motionless, crying at the touch of one's hand, or upon any movement. The bleeding gums and the skin hemorrhages may be absent in children and the case still be one of scurvy. The disease is fatal unless treated. The treatment consists in relieving the tension on the bones and joints by packing the child in cotton and keeping him very warm. This affords great relief, but the cure is obtained only when we give the child freely juices of fresh fruits, mashed potatoes, and raw milk. Raw beef-juice is also useful. In other words, the child has been deprived of some food element found in raw foods (especially, in mother's milk) and destroyed by cooking. The cure takes, of course, weeks, and takes a very careful adaptation of the food to the condition of the child's digestive apparatus as it changes from day to day.

Rickets.—Another disease of infancy is rickets. This, also, is a result of malnutrition. In this case it seems as if the lime salts are not absorbed from the food and utilized to build up the bones. The epiphyses of the bones are swollen and softer than normal. The forehead becomes broad with projecting bosses. The fontanelles of the skull remain open. The line of union between the anterior end of the ribs and the cartilages is shown by a line of knobs or beads (rickety rosary). The abdomen is prominent and the liver and spleen enlarged. The child is restless at night, its head sweats until the hair on the back of the head is worn off, and there is a tenderness to touch all over the body. The child can not walk and usually not even creep. This disease does not cause death of itself, but makes the child liable to perish from intercurrent disorders. The treatment is the feeding of lime, phosphorus, and cod-liver oil for drugs; and the dieting of the child on strong food such as beef-juice (freshly pressed out), eggs, fresh fruits, and cream. Cold sponge baths should be given every morning and the child should be kept in the fresh air and sunshine as much as possible.

Hereditary syphilis is one of the most unpleasant disorders of childhood, because of its origin and because one feels that the unfortunate sufferer will never become a very useful citizen, even if he grows to manhood. The signs of congenital syphilis are hemorrhage, either from internal organs or the navel, leading to death in a short time; acute coryza, or snuffles; excoriations and eruption about the nates; pemphigus, especially on the soles of the feet and palms of the hands; inflammation of the bones ("epiphysitis"), of the iris and cornea of the eyes; and general inability to absorb food and grow. In other words, hereditary syphilis may be the cause of the malnutrition and general tendency to inflammations, etc., from which the infant may be suffering. The treatment is the use of the iodids, coupled with careful feeding and oversight.

Cretinism (myxedema), another affection of childhood, is due to a lack of thyroid secretion. The gland may be absent or atrophied, or the secretion so changed as to be ineffective. The symptoms are dulness of intellect, thickness and bogginess of skin, and a lack of growth, especially of the long bones. The tongue frequently protrudes from the mouth, the nose is broad, flattened and depressed. The legs are bowed, and the gait is awkward and slow. The abdomen is prominent. The fontanelles remain open. In general, we have the signs of an arrest of development. The condition is hopeless unless thyroid secretion can be supplied. If the lack of secretion be not due to a tumor pressing upon the thyroid gland, the treatment consists in feeding the thyroid extract of sheep. This must be given in all cases where there is an absence or malformation of the gland as part of the patient's daily food practically through life. If there is a tumor or malformation, operative treatment is necessary.

Croup may be either a spasmodic contraction of the glottis, or diphtheria. The ordinary croup which causes so much terror to mothers is usually the former, and is essentially a nervous trouble and calls for the building up of the nervous system. An attack is relieved by the inhalation of steam (with eucalyptol, if that be at hand) and the application, in alternation, of hot and cold cloths to the chest. For diphtheritic croup the regular treatment for diphtheria is indicated.

Enuresis, or involuntary urination, may be due to bad teaching on the part of the mother or nurse; to reflex irritation from pin-worms, or from a hooded clitoris, or a long prepuce; to habitual indigestion because of improper diet; or to general nervousness. This is hardly a disorder of infancy, but since its foundations are laid in infancy, it should be considered here. In other words, the nurse should, from earliest infancy, pay attention to the establishment of good habits of defecation and urina-

tion, and teach the mother how to feed the growing child, and inculcate the importance of regular hours and plenty of sleep. The emptying of the bladder just before going to bed is a matter worthy of particular emphasis in the establishment of right habits.

Night-terrors.—When a child wakes up at night crying out with terror, something is usually the matter with the digestive tract. Examination should be made for the presence of intestinal parasites. If this prove negative, then the diet should be regulated and the last meal at night should be small and very digestible.

Cyclic Vomiting.—When a child has a regularly recurring (*e. g.*, every two or three weeks) attack of indigestion and vomiting, one should look after the condition of the liver. These cases, if uncured, develop into migraine later in life and persist until at about the age of forty-five they cease because of the hardening of the sensitive tissues (arterio-sclerosis) causing the reflex. The treatment consists in getting the child into the country, relieving him of all mental strain, fitting the eyes with glasses if there be an ocular defect, and in keeping the digestive tract in excellent condition. The particular drug treatment consists in keeping the bile flowing freely by means of the regular administration of calomel and salines.

Children are frequently troubled with **adenoids,** or overgrowths of the tonsillar tissue in the posterior nares. The symptoms are mouth-breathing and a lack of development of the nose and face. The intellect seems also to be affected, and the child is backward and dull. The treatment is simply the removal of the hypertrophied tissue.

Prolapse of the rectum and **intussusception** are two troubles due to the flaccid condition of the infantile bowel. The former is a self-evident trouble, and requires the very best of mechanical treatment. Pending the doctor's arrival, the nurse should try to replace the bowel, using

heat and warm oil to relieve the spasm. Intussusception is not so easily diagnosed. Its symptoms are constipation, pain, distention of the abdomen, vomiting, rapid pulse, and subnormal temperature. It requires operative interference, unless relieved at once by atropin, massage, and olive oil. The nurse should apply heat to the painful point in the abdomen until the doctor gives other orders.

Of course, **diarrhea** and **dysentery** are the most common disorders in hot weather. The diarrhea may be due simply to the heat; but usually any severe attack is due to the added influence of infection. The fermentation of starchy foods occurs more easily in hot weather than in cold. Therefore, during the heated term a proteid diet should take the place of the carbohydrate one. Thus, gruels of barley, oats and wheat are taken better than milk, and should therefore be substituted for the milk during the hotter part of the day. The finding of mucus and undigested foods in the stools, or even a rancid smell demands instant attention. When blood appears in the stool and when the anus and rectum are reddened and sore, it is time for the administration of astringents such as bismuth and tannalbin. The general dietary treatment is, of course, to change the food at once to a predigested proteid mixture. For the irritated mucous membranes, 5 to 10 grains of subnitrate of bismuth stirred up in water should be given by the mouth. For the irritation of the rectum, injections of a starch emulsion are effective. This should be made by boiling the starch in enough water to make it just thin enough to flow nicely through the syringe or tube. Before using it, the bowel should be cleaned by a water enema and then the starch put in under just enough pressure to drive it up into the sigmoid flexure and against the walls. The patient should, of course, lie quiet for a while after the injection of the starch.

Colic in babies is usually due to the gas caused by fermenting food. It should be prevented by using non-

fermentable foods (*e. g.*, foods in which the starches have been predigested with diastase, etc.). It should be treated by using enemata to free the bowels of solids, and then inserting a soft rubber catheter four or five inches into the rectum to permit the escape of the accumulated gas. When hiccoughs attend the colic, hot water by the mouth in teaspoonful doses will be found helpful. After the child is relieved of the worst pain of the colic, two or three tablespoonfuls of olive oil injected into the rectum seem to have a good effect in preventing an immediate recurrence.

Epidemic cerebrospinal meningitis has a predilection for children. This seems to be an infectious disease and to be caused by a minute, intracellular organism (a diplococcus, found inside the cells of nervous tissue generally), found by examining the fluid drawn from the ventricles and spinal canal of those sick with the disease. The incubation period varies greatly (thirty-six hours to one month). The onset is attended with chills, vomiting, headache, backache, and a painful rigidity of the neck and back. The fever varies from 101° to 105° F. The child starts at slight sounds and shows signs of pain at ordinary noises. The head is drawn back and sometimes the back is arched. There are usually convulsions followed by stupor and coma. There are albumin and sugar (and sometimes blood) in the urine. The respiration is not greatly affected, but the pulse is slowed. Eruptions, either herpetic or purpuric, occur in most cases. Naturally, there is constipation. The pathologist finds a great leukocytosis in the blood. An interesting symptom is that called Kernig's sign: flex the thigh at right angles to the abdomen, then the leg upon the thigh; if meningitis be present, extension of the leg is then prevented by a contraction of the flexor muscles. A lumbar puncture between the second and third, or between the third and fourth vertebræ, is frequently done to establish the differential diagnosis between the epidemic and other

forms of meningitis, by obtaining a sample of the cerebro-spinal fluid and examining it for the causative organism. The prognosis is bad, ranging up toward 80 per cent. of deaths. Those that recover bear with them for life the marks of the disease, except when the attack has been exceptionally light. The treatment is chiefly palliative. Cold packs and ice-bags are applied to the head and spine. Very little feeding by the mouth can be attempted. The nurse's chief effort should be to protect the patient from light and noise, and to stimulate the vital organs by hydrotherapeutic treatment and the hypodermic use of appropriate drugs until the force of the attack be spent.

Another nervous disease of childhood is **acute anterior poliomyelitis** (cerebrospinal paralysis of children). In this disorder the cells in the anterior horns of the spinal cord are attacked, with the result that the nerves dependent upon them for nutrition degenerate. The attack may come on in apparently perfect health, and is notably frequent in children under three years of age. The attack may be accompanied by fever and other symptoms of an acute disorder; but, usually—because the cause of the disease is probably not a living organism, but the shutting off of the blood-supply to the affected cells by means of a thrombus or other obstruction in the artery—there are few objective symptoms until pain and tenderness appear in the muscles (of the leg usually) supplied by the affected nerves. Then comes the flaccid paralysis, the limbs lying limp and useless. Sensation in the parts affected remains normal. Soon comes atrophy, and the shrinking of the arm or leg, as the case may be. The groups of muscles most often affected are the peroneal and tibial. Recovery from this paralysis is rare although death rarely results from the attack. Sometimes hot fomentations, brisk eliminative treatment, and electricity have some effect in reducing the area affected, or, if the cause be ptomain poisoning, in curing the disorder. This line of treatment should always be adopted, and the general

massage and electric stimulation should be kept up for weeks.

St. Vitus' dance, or chorea, has for its chief symptom an involuntary incoördinate jerky movement of some group of muscles. Thus, it may be the shoulders which shrug constantly. It may be the chin and neck-muscles that keep in action. Sometimes it is only an irregular, asymmetric contraction of the muscles of the lip or eyelid. The disease attacks more often females between five and fifteen years, and seems to be due to an overtaxation of the nervous system either in school or in unwise indulgence in late hours and similar excitement. It may follow rheumatism, but it is usually brought out by accidents or some shock or nervous worry. The face is most commonly involved. The speech suffers in 25 per cent. of the cases. The mind suffers in only the most severe cases. The length of the attack is usually from two to three months. In about half the cases the disease recurs. No deaths result from the disease itself, but may result from the underlying weakness.

This disease, called also Sydenham's chorea, must be differentiated from Huntington's chorea, which is hereditary and comes on adults in their thirties and leads to dementia. Friedreich's ataxia presents the picture of a more general involvement; thus, it has nystagmus, scanning speech, scoliosis, and a slowing of motion. Hysteria, of course, imitates chorea, but usually is more rhythmic and coördinate. The treatment is essentially that of removing the child from school and all other causes of worry. If the case be severe rest in bed is necessary. When rest in bed is not needed or when convalescent, the patient should be sent to the country where she can live out of doors the whole day and where she can develop strong muscles and healthy digestion. Iron and arsenic are the two drugs usually employed besides those used to combat special symptoms.

Hydrocephalus belongs strictly to the newly born

Fig. 22.—Result of hydrocephalus. The child is now eight and one-half years old. Circumference of head 33 inches (case of Dr. Moses of Salina, Kansas).

infant; indeed it is usually congenital. It is essentially the accumulation of fluid in the ventricles of the brain ("water on the brain") with the consequent distention of the brain and skull. Its cause is, in a large percentage of the cases, tuberculosis; it may also, apparently, be due to trauma. Its results are always bad, because if the child survives at all it is usually weakminded, even if the body be not dwarfed and undeveloped. The skull reaches enormous dimensions, the fontanelles are open, and the hair thin. The treatment by puncture is usually unsatisfactory. Bandaging the head is also unsatisfactory.

The best general treatment is to apply ice to the skull, and so support the head that it cannot be jarred or moved violently. The bowels and bladder must be emptied without disturbing the child. Hot baths are given to stimulate the circulation in the rest of the body. Sometimes the alternation of heat and cold is necessary to keep the respiration going.

CHAPTER XXIII.

SOME CONSTITUTIONAL TROUBLES.

Diabetes Mellitus.—Diabetes mellitus may be described as one of the so-called constitutional diseases which have not as yet been thoroughly localized and which affect the metabolism of the whole body.

As far as the patient is concerned, the chief complaint in diabetes is of inordinate thirst, and also of the tendency for slight sores not to heal as similar injuries would in healthy persons. Other symptoms are pruritus or itching, especially about the genitalia, lumbar pain, excessive appetite with growing emaciation in spite of the increased supply of food.

The physician, on the other hand, defines the disease as that disorder of the body economy in which sugar appears constantly in the urine. Normally, sugar appears in the urine only after a heavy meal, or when an excessive amount has been ingested. This means that in diabetes the organ or organs in the body which have charge of converting ordinary sugar or dextrose into the forms in which it is stored for use in the liver and muscles are insufficient. As far as we can discover, this conversion of sugar into glycogen, etc., takes place in the liver. However, a puncture of the nerve-centers at the base of the fourth ventricle in the brain also produces albuminuria (sugar in the urine). Furthermore, in diabetic subjects, the pancreas sometimes appears diseased; therefore, we are not in position to say that the disease is essentially a liver, a nervous, or a pancreatic disease, although all these tissues seem to play a large rôle in its development.

Sometimes the disease is rapidly fatal; but, in general, the patient may live for years, provided he follow a careful course of life. The danger is usually, then, that the patient is so reduced by the diabetes that he succumbs readily to acute infiammations (such as pneumonia) and accidents.

The *treatment* is based upon the avoidance of anything that puts a strain upon the weakened organs. Therefore, as little sugar as possible is to be eaten. The first step in the treatment is to establish a diet of meat and green vegetables. Ordinary bread cannot be used because of its large content of the carbohydrates. For similar reasons, potatoes must be laid aside. Vegetables that may be used are such as cabbage, tomatoes, cauliflower, asparagus, green beans, radishes, onions, etc. For sweetening coffee, and other bitter foods, saccharin or levulose should be used. Light wine, coffee and tea are not prohibited.

Violent exercise and great demands upon the patient's strength must be avoided.

Fig. 23.—Gout (case of Dr. J. W. Perkins).

Fig. 24.—Gouty deposits in the ear (case of Dr. J. W. Perkins).

Nurses should pay great attention to the condition of the skin of diabetic patients, and while they avoid bruising it, should keep the circulation in it thoroughly active.

Gout is a disease characterized by a paroxysmal and painful inflammation of the small joints, particularly of those of the great toe, accompanied by the deposit of sodium urate. The deposit of urates in the joints argues that the blood is overloaded with them. This may mean that the liver does not make them ready for elimination from the body by the kidneys or that the kidneys, for some reason or other, fail to eliminate them. That there is an excess is due in most cases to high living coupled with deficient exercise, whatever may be the reason why the emunctories do not carry off the excess. Most of the patients suffering from gout have, at some time or other, led a rather vigorous life, and have thus established a habit of taking and using considerable strong food. When now they become inactive, they usually do not decrease their eating and drinking in the proportion in which they have decreased their exercise. Hence, there is a lack of equilibrium which sooner or later shows itself either as gout, or rheumatism, or obesity.

The attacks usually come on at night, and pass away with the return of day. The joint is swollen, the skin darker than usual, and exceedingly tender. Sometimes bronchitis, asthma, and indigestion of various types attend the attacks. Between the attacks the patient is quite comfortable; and only pays attention to the treatment of the underlying trouble when the attacks begin to come so close together that he cannot quite forget them. The *treatment* of the attack is the application of warm bandages, absolute quiet, and internally anodynes. A very good local treatment is to apply a warm and moist bandage snugly, and then place enough hot water bottles and similar carriers of heat around it to keep it warm. The foot should be raised to be on a level with the body. The local application of guaiacol (liquid) is also sometimes

helpful. The anodynes used are morphin, atropin, and colchicin.

Between the attacks the patient should become if possible more active out of doors. Since, however, most of our gouty patients will not do this, we are driven to bring about an increased elimination by means of mineral waters, vapor baths, and massage. It is usually best to send the patients away periodically to watering places and sanitaria where their lives may be regulated.

Obesity does not give the pain and discomfort of gout; but the added weight of the body, the masses of fat pressing on vital organs, and the added heat all put an extra strain upon the circulation of the blood and other processes, so that obese people suffer from myocarditis, from varicose veins, from edema, and even from fatty degeneration of the liver and kidneys. The disease itself is, like gout, due to a lack of equilibrium between the ingestion and egestion of the materials going to make up the body substance. Probably also in some cases the proteid eaten is broken down into fat. In other cases, the condition is due simply to an inordinate fondness for fatty foods.

The *treatment* consists in restricting the kind and quantity of food taken. Thus, the amount of fluids may be reduced to three pints a day. The meat eaten should be only the lean. Vegetables should be taken freely. Bread and potatoes should be restricted. Then, the patient should have a Turkish bath once a week. The amount of outdoor exercise should be gradually increased. In general, the cure consists in an entire change of the habits of the individual; although some patients prefer to go away every few months and take a rather severe course of reducing treatment (starvation, sweat-baths, etc.) and then return home to "live high" during the intervals.

Fig. 25.—Pathologic obesity (case of Dr. J. W. Perkins).

CHAPTER XXIV.

BLOOD DISORDERS.

Some diseases show their effect chiefly in the changes in the composition of the blood, and because we do not as yet know of any other localization, we call them blood disease. Thus, we have anemia,—the disease in which the number of the blood-corpuscles is decreased and the oxygen carrying power of the blood diminished. We have also a leukemia wherein the relative number of the red and white corpuscles is changed by a permanent increase in the whites; and we have a chlorosis where the coloring matter is decreased more than the number of corpuscles.

A hemorrhage produces an anemia in which the corpuscles and coloring matter of the blood are diminished in the same ratio—but since we know the cause, we call it a secondary anemia. There are, however, two primary anemias; that is, diseases of which we do not know any definite cause—chlorosis, mentioned above, and pernicious anemia, which shows a higher percentage of hemoglobin than of corpuscles.

Many diseases, especially those accompanied by the formation of pus, are characterized by a relative increase in the number of white cells. This is called a leukocytosis. This occurs physiologically also after a full meal, and may last one or two hours. In pneumonia, appendicitis, and similar diseases, it is present from the start and gives the physician great aid in making the diagnosis. In typhoid fever, on the other hand, we have just the opposite—a decrease in the number of white corpuscles, or a leukopenia. Hence the study of the blood is necessary in every important disease,—because it gives an idea of the reaction of the body to the disease. This

examination is made by puncturing the finger or the lobe of the ear, and taking out a few drops of blood and learning the number of the corpuscles in a cubic millimeter by counting the number in a number of spaces about one-millionth that size and estimating the percentage of hemoglobin present.

The normal number of red cells or corpuscles is about 5,000,000 in a cubic millimeter. In **chlorosis,** the number is between 4,000,000 and 4,500,000, while the hemoglobin is only about 40 to 70 per cent. This disease comes on in young girls between fifteen and twenty years of age. The waxy skin and general weakness are the only other general symptoms than those of the blood. Since hemoglobin is an iron compound, chlorosis indicates a decrease in the iron content of the blood, and a lack of it in the nutrition of the tissues. Therefore, the treatment of chlorosis consists in giving the patient rest and feeding her iron. This usually results, after six weeks, in a complete cure. Since iron is usually withdrawn from the circulation and stored up by the female organism after the onset of puberty, it is generally very good practice for every mother to feed her daughters iron at this time of life and not to wait for the onset of chlorosis before doing so. That the habits of life are of influence also is shown by the fact that girls who lead free open-air lives in the country are rarely troubled by chlorosis.

Pernicious anemia shows a percentage of hemoglobin of, say, about thirty, while the corpuscles number about only one million instead of five million. It usually attacks men of middle life, and is generally fatal. However it is a disease which can only with difficulty be differentiated from gastric cancer and the anemia caused by parasites in the intestines. Thus the hook worm of the southern states and Porto Rico produces a condition almost identical with pernicious anemia. Hence the belief is prevalent that pernicious anemia is a disease caused by the toxins (usually from germs) which bring

about the disintegration and solution of the blood-corpuscles. Therefore in all cases of anemia of this type it is important not only to cleanse and keep clean the intestinal tract, but also to use such antiseptics as shall destroy any parasites which might be clinging therein. The patients must, of course, rest in bed and be well fed. The only drugs given are arsenic and intestinal antiseptics, but the former must be given in immense doses. The use of the *x*-ray seems to be very helpful in stimulating the formation of corpuscles in the marrow of the long bones. The use of colonic irrigation for keeping the colon clean is an important part of the nurse's work. The solution used for this should be quinin, one-tenth of 1 per cent. of the bisulfate. The tube should be inserted with the patient lying on his left side, and should pass if possible the sigmoid flexure. The solution should be put in slowly, with two feet of gravity pressure. The treatment to be successful must be continued over months.

For an ordinary **secondary anemia** due to hemorrhage or overwork, all that is needed is rest in bed with plenty of eggs and meat in the diet, and iron, etc., for medicine. Massage, passive movements, cold-water baths, are all useful in stimulating this regeneration of the body. In introducing a patient not accustomed to them to cold-water baths it is well to begin with cold sponge baths (water beginning at 70° F.) and then gradually bring in sprays and tub baths. The shock of a plunge into cold water may be so great that if given the tub bath at the beginning of his course of treatment the patient may refuse to take further treatment—and the wise nurse cares for the mind as well as the body of her patient.

Of late years we are discovering that the body manufactures antidotes for almost every poison brought into it. Thus, we all know how the body manufactures an antitoxin which neutralizes the toxins of diphtheria and kills the diphtheria germ. We know that this antitoxin is found floating in the plasma of the blood, and that we can

get an extra supply for injecting into patients by taking it from the blood of horses that have had diphtheria and recovered. In the same way the blood neutralizes morphin and arsenic, when the latter are put into the body in small doses day after day.

The body can go still further and destroy the germs themselves which are floating in the blood by having them swallowed up by the white corpuscles. But the body can do this only when the germs are still few in number, and when the blood itself is very healthy. This activity of the white corpuscles is called phagocytosis, and is really only another evidence of the amebic power of these leukocytes.

These two discoveries are leading us to believe that the best way to treat disease is to stimulate the body to make its own antidotes and to inject the blood-serum of animals, which have overcome the particular disease, when the patient seems too weak to produce enough antitoxins of his own. This method of treatment is illustrated by the vaccination for smallpox, and by the use of both vaccines and serum in cholera. For this reason the study of the blood is becoming more and more important, and the treatment of the sick coming to depend more and more upon the nursing which enables the diseased body to husband and utilize all its powers for combatting the disease.

CHAPTER XXV.

TONSILLITIS.

The tonsils are little masses of tissue about the size of thimbles projecting slightly into the oral cavity just back of the teeth and at the opening of the throat. There is one on either side of the throat, and they are of the same substance as several other glandular masses which are to be

found in the passage leading from the throat to the nose. This tissue is called adenoid tissue and possesses the property of weakening the virulence of bacteria which come in contact with it. It is also a very moist tissue and seems, therefore, to have the two-fold function of keeping the throat moist and of catching and inhibiting the microbes, which might otherwise pass down to the lungs with every inspiration. This tissue seems to be better developed in youth and to disappear gradually in old age.

Inflammation of these tissues takes one of three forms; *i. e.*, it may be a simple swelling or inflammation of the tonsils; or the depressions in the tonsils, called crypts, may be covered with white patches of false membrane somewhat like that of diphtheria; or, third, abscesses may be formed in the depth of these depressions—this is the so-called quinsy. The first is the usual accompaniment of a sore throat and lasts ordinarily two or three days. The second variety, called lacunar or follicular tonsillitis, is attended with severe constitutional symptoms, such as fever, prostration, and headache; and is sometimes very difficult to distinguish from diphtheria. It lasts from a week to ten days. The third variety is usually of longer duration and may be a development of either one of the other two.

As our discussion indicates, the usual cause of tonsillitis is the settling of microbes upon the tonsils in such numbers that the tissues are unable to overcome them and they set up this inflammation. That the cause of this inability of the tonsils to overcome the bacteria is due to a chilling either from within by means of cold drinks or from without by means of a draft, does not invalidate our statement that the essential cause of the trouble is bacterial. Furthermore, it has been found that the bacteria quite readily pass from the tonsils to the blood-vessels and thereby give rise to very serious diseases, such as meningitis, rheumatism, measles, and scarlet fever. Therefore, an inflammation of the tonsils is not to be

lightly disposed of. We would also call attention to the weakening influence upon the resistance of the tissues of the neck and tonsils from the wearing of heavy neck protections in winter, such as fur boas and tight collars.

Repeated inflammation of the tonsils produces a permanent enlargement and hardening of their tissues, which in turn renders them more liable to become inflamed and less able to overcome bacteria which may settle upon them. They are then also more easily permeated by bacteria which may work their way into the general circulation. When the tonsils get into this condition, it is far better to have them removed than to run the constant risk of their setting up some severe constitutional affection. Their removal, or at least the removal of the unhealthy tissue, leaves no permanent injury to the system; and if done carefully under a local anesthetic has no danger from hemorrhage or pain.

An ordinary attack of lacunar tonsillitis begins with a rather high fever, the temperature running as high as 104° F. There might be no local pain or symptom pointing toward the tonsils. Sometimes earache may be present; sometimes there may be difficulty in swallowing; sometimes the patient may complain chiefly of digestive disturbances; so that it is well in all ill-defined fevers to look carefully at the tonsils to see if the cause of the fever is not to be found there.

When one, in such an examination, sees whitish patches in the back of the throat or on the tonsils, one should be suspicious of diphtheria, especially if these whitish patches are not easily removed. In such a case it is necessary to take off some of the false membrane on a sterile swab and send it to a laboratory.

The home care of a patient suffering from tonsillitis consists in rendering him as comfortable as possible by means of local applications. The neck should be swathed in hot packs, made by taking a towel four to six feet long, wringing one end out in water as hot as one can

stand and wrapping it around the neck from the ear to the shoulder, the wet end being next to the skin. If this wet end is well covered by the dry end, so that the water cannot evaporate, the neck will be kept comfortable. The throat and mouth should be cleansed with some antiseptic solution, such as peroxid of hydrogen, applied freely and liberally. The food should be as nourishing as possible, but must be liquid. It is better to give it rather warm. The bowels should be kept open; and, in general, by means of hot baths and similar applications, the patient induced to perspire freely. If an abscess be developed, then, of course, the thing to do is to incise it and let out the pus.

Now, the dreaded sequelæ of tonsillitis are: pneumonia, caused by the progress of the inflammation downward; nephritis, or inflammation of the kidney, when the bacteria reach the circulation; endocarditis, when bacteria settle in the heart, especially on the heart valves; otitis media, when the bacteria pass through the post-nasal passages into the Eustachian tube back into the middle ear, and there settle. This last is the one to be especially feared in a changeable climate, such as that of the middle west; and can be avoided only by eternal vigilance in the way of constitutional and local treatment. Because of the seriousness of all these affections, it is usually advisable to have a physician direct the treatment of every severe case of tonsillitis; and especially of recurrent cases.

Adenoids.—In this connection, we should like to mention the overgrowth of the adenoid or glandular tissue in the back of the nose which is specially liable to occur in young children, where it forms a so-called adenoid vegetation. This vegetation practically closes the passages for respiration; and these children, because of this lack of aeration of the tissues in and about the front of the brain, become mouth breathers, dullards in school, and even stunted in their development. Whenever, therefore, a child is found to be breathing with difficulty through its

nose, or sleeping with its mouth open, a physician should be called to determine if there are such obstructions; and, if he reports that there are, their removal should at once be undertaken.

The **lingual tonsil** may become infected with tuberculosis, and in such case, is liable to infect the cervical glands and produce the so-called scrofula. This danger is greater in children than in adults. Therefore, nurses need to pay special attention to this tonsil in oral affections in children.

Vincent's Angina.—There are two inflammations of the mouth and throat that may be mentioned in this connection. The first is Vincent's angina, an inflammation of the tonsils and fauces, with a membranous exudate closely resembling that of diphtheria. The fever is less than that of diphtheria, as are also the constitutional symptoms like prostration and cardiac weakness. The neighboring lymph-glands swell. The attack may be so severe as to lead to an ulceration of the uvula and the soft palate.

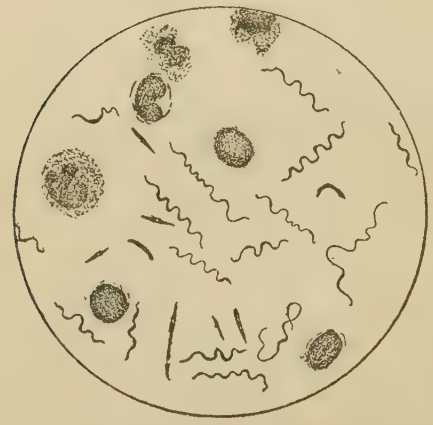

Fig. 26.—Spirillum of Vincent's angina, as it appears in a scraping from the mouth.

The disease is caused by a spirillum (see Fig. 26), of the life history of which very little is known.

The *treatment* is best carried on by touching the affected areas with carbolic acid (followed by alcohol) or other caustic. Great cleanliness and the disinfection of the

sputum as well as the articles coming into contact with the patient are necessary. The external application of wet (and hot) compresses will be found soothing to the patient. Of course, only liquid food can be taken during the attack, and that in small quantities.

Ludwig's Angina.—Following septic fevers—such as diphtheria, scarlet fever and typhoid—there may arise a gangrenous inflammation of the floor of the mouth, beginning in the submaxillary gland. It is probably a "streptococcic" infection. It spreads backward to the fauces and may set up glottis edema. The soft parts may slough—*cynanche gangrenosa*—or an abscess may be formed. It is rare for the affection to end by the absorption of the pus. Of course, swallowing is painful. The fever rises and falls irregularly as in other septic conditions.

The *treatment* consists in an energetic cleansing of any exposed foci of infection, the application of heat (or hyperemia may be induced by the vacuum cups), and the administration of antiseptics. The spread of the infection to other parts of the body must be guarded against, and the early incision of the abscesses energetically carried out.

CHAPTER XXVI.

GASTRIC DISORDERS.

Dyspepsia, or **indigestion,** is perhaps the most common trouble in America. It may assume various forms, and may be due to various causes. The chief cause, however, and the one which can be removed most easily is lack of sufficient mastication of food. Americans are in too much of a hurry to take the time necessary to masticate their food thoroughly, and hence they swallow it in

masses which the stomach cannot take care of. But even then there would be less indigestion were it not for the fact that our people are living under such high pressure that they do not give the digestive organs time and strength sufficient to take care of the food that is put into them, for digestion depends upon the presence of plenty of pure good blood; and this blood-supply, of course, is not present when the person is using that blood for active muscular exercise, for solving business problems, or is interested very much in anything else. In other words, good digestion demands freedom from care and worry and a state of contentment which permits the normal functions to go on without thought and attention. Another factor in the production of dyspepsia is an injudicious choice of foods, as well as the poor quality of the foods used. We are, however, rapidly passing beyond this stage and every year there is less cooking in fats and less adulteration and substitution in our food supplies than the year before.

There may be several very different conditions present in dyspepsia and each one may require a different method of treatment, as well as a different course of life; therefore, here as in other obstinate diseases the matter of diagnosis such as can be obtained only after several days of observation, with the use of test-meals, is important.

In the first place, nervous people are very apt to suffer from an overproduction of the acids of the stomach (hyperacidity). This prevents the correct digestion of the breadstuffs and starchy foods, and may produce gastric ulcer. Again, in weakened and exhausted people the trouble may be due to a lack of secretion of pepsin and other digestive ferments (anacidity). In this case fermentation occurs and the patient is troubled with bloating, the eructation of gas, and with consequent dilatation of the stomach. A third condition is the lack of muscular tone to the digestive organs (*e. g.*, in gastroptosis, or sinking of the stomach below the normal level), so that

food is not passed on from the stomach to the bowels and absorbed into the system as it should be. This again produces fermentation, with all its consequent evils. The very frequent troubles, especially in women, due to constipation may have their ultimate cause in an indigestion of one of the three classes named above. Of course, indigestion may also be due to some organic or constitutional disease such as consumption or cancer or heart disease.

The part that nursing plays in the *treatment* of dyspepsia is that of carrying out the dietary arrangements prescribed by the physician. That work, of course, is chiefly in the hands of the cook and the following out of carefully made recipes is the most important part of it; nevertheless, I feel that it is important to use this opportunity to emphasize the need of careful scientific supervision of such cookery. For instance, if the physician prescribe "oven dried" toast, or zwieback, it should be made not by taking a thick slice of bread and putting it over the hot fire for a few moments until the sides are charred, but, by securing, in the first place, a close-grained bread, then cutting it into thin slices and drying them completely through in a very slow oven (taking at least fifteen minutes to do it), and, finally, by toasting the surface of the bread. This is practically the same as the German zwieback which may be made, however, if so demanded by the physician, by adding eggs and sugar to the bread dough. A good substitute for this toast is the granose biscuit made by the Battle Creek Sanitarium people, or the triscuit made by the Natural Food Company of Niagara Falls.

When steak is prescribed, it should be cut thick and cooked, not in grease, but upon a broiler or toaster; or, if this is not at hand, upon a very hot griddle without any addition of grease. It should not be cooked clear through. Such steak is really both appetizing and digestible.

When a milk diet is prescribed, it may be varied and the

patient relieved from its monotony by the use of various milk preparations such as soups made with a basis of milk flavored with celery or vegetables, junket, or even bread and milk (the bread employed having been previously toasted). Perhaps the best form of milk for patients needing a stimulating food is koumyss. This is made by the fermenting of milk with yeast. Some people prefer a kefyr to koumyss, which is milk fermented with a Caucasian fungus, which can be procured of drug stores in the larger cities. Both of these, however, contain a minute amount of alcohol and for that reason may be objectionable.

When eggs are prescribed, especially soft-boiled, they should not be served in a pasty condition but simply thickened—practically raw. Most easily digested by the weak or diseased stomach is the jellied egg. A fresh egg is placed in cold water over a slow fire. The water is slowly brought to a temperature just below the boiling point and kept there for a minute or two. The egg, which should be immediately broken and served, will have a soft yolk, and a thickened (neither hard nor tough) white. Eggs may also be baked and be digestible. Again, if they be presented in the form of an egg-nog, they are still more easily taken. Egg-nogs are made in various ways. One can beat up simply the white of an egg with cream, and stir in the yolk afterward, with some sugar and slight flavor; or one may stir up the entire egg with cream and sugar. The addition of alcohol to this mixture is usually bad and should not be done without the special advice of the physician. In this connection it might be well to state that it is well to have at hand such textbooks as Sachse's "How to Cook for the Sick," or a similar work which gives the details of such cookery.

The fundamental principles upon which dieting proceeds are that each person must have when moderately active 116 grams of proteid and about 3000 calories of heat energy each day. It is best, unless some peculiarity of the diges-

tive apparatus demands otherwise, to distribute the food among the three classes of food-stuffs—fats, carbohydrates, and proteids—so that bulk, appetite, and digestion are conserved.

Of the so-called organic diseases of the stomach **gastric ulcer** deserves special mention here. It consists in a round, smoothly bored-out hole in the stomach, beginning in the mucous membrane and extending usually through the muscular coat of the stomach. It is usually caused by a long-standing hyperacidity of the stomach contents. Its symptoms are those of hyperacidity (pain when the stomach is empty and also about one hour after taking food), plus some bleeding and tenderness on pressure over the stomach. The outlook for gastric ulcer is bad, because even if it heals over, the scar is apt to degenerate into cancer. The treatment consists in absolute bed rest for several weeks, the first two or three of which should be without any food by the stomach whatever. Then, the food first taken must be predigested milk, etc., increasing the amount and varying the articles as the attending physician may direct. Surgical treatment (*i. e.*, the cutting out of the ulcer) has been recommended but has not received full endorsement except for cases of perforation.

The dangers and the consequent emergencies from gastric ulcer are, first, *perforation* of the stomach wall, thus permitting the stomach contents to flow through into the peritoneal cavity there to set up a peritonitis. The symptoms of this are quite similar to those mentioned in the case of perforation in typhoid fever: pain, shock, collapse, pinched expression of the face, rapid pulse, cold sweat. While she is awaiting the arrival of the surgeon, the nurse should inject strychnin (gr. $\frac{1}{30}$) hypodermically, and apply ice-bags to the epigastrium, and arrange for an immediate operation. The second emergency is *hemorrhage*. The symptoms of this are the vomiting of fresh blood, and the passage per rectum of changed blood (*i. e.*, darkened masses of decomposed

blood). Here, also, there is a rapid pulse, and general symptoms of weakness. For this the emergency treatment is the giving of bismuth subnitrate in dessertspoonful doses (in enough water to make an emulsion), and small pieces of ice, and again, the placing of an ice-bag over the epigastrium. For the pain of gastric ulcer, rest in bed, heat (hot-water bag), and bismuth are indicated.

Gastric cancer is a surgical disease. When, however, as usually happens, it is discovered too late for an operation, then it becomes the trying task of the nurse to keep the patient comfortable. The diet must be at least semi-liquid, and so arranged as not to depend at all upon the stomach for its digestion. Vegetables and other masses of indigestible cellulose must, of course, be avoided. The diet list includes milk, eggs, scraped steak, custards, junkets, broths and soups, etc. Bread is apt to set up fermentation unless it passes immediately into the bowel. For the same reason potatoes can be given only rarely. If the lumen of the pylorus be narrowed, then, of course, we have stenosis and the damming back of the stomach contents. This of itself leads to the fermentation of the stagnant food lying in the stomach, and the consequent discomfort and pains from the distention of the organ and the absorption of the ptomains. For this reason, the patient's last days would be appreciably brightened if a gastro-enterostomy be performed, so that food can pass easily into the intestine. The pain of stomach cancer is usually not severe, and can usually be quieted by the application of heat, although the physician will not hesitate to give morphin. Hemorrhage and perforation require the same emergency treatment as in gastric ulcer.

Gastric dilatation is usually a consequence of pyloric stenosis or of the atrophy of the stomach wall. The muscle of the stomach is thinned and weak. The glands do not yield proper secretions, and the standing of the food in the stomach for hours leads to stagnation and

fermentation. In health the greater curvature of the stomach is higher than the outlet. But, in dilatation, the greater curvature of the stomach sinks to below the level of the outlet (pylorus) and only when the patient lies on the right side is the outlet at the lowest point. The treatment consists in washing out the organ with the stomach-tube and in stimulating it to some regeneration by electricity and massage. The stomach should

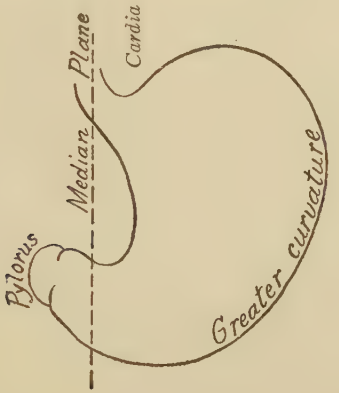

Fig. 27.—Normal position of the human stomach (Reed). (Contrast this with usual conception of the normal position.)

be flushed each morning, or late at night if the last meal begins at least four hours before the washing. In this disease the meals should not be frequent; two or three a day are sufficient. Food that does not easily ferment should be chosen. Patients should lie down for an hour after each meal, preferably on the right side.

Pyloric stenosis even when it is not caused by cancer should be treated by a surgeon. The narrowing and

thickening of the outlet cannot be helped by medicines. While in charge of such a case the nurse must follow the principles of feeding noted above.

CHAPTER XXVII.

TWO POPULAR DISORDERS, CATARRH AND ASTHMA.

CATARRH.

Popular usage and quack literature have transformed the word catarrh from a scientific medical term to a loosely used, indefinite, and frequently misleading slogan. The term originated in the days when physicians, because the microscope and other means for obtaining exact knowledge were not yet at hand, believed that disease was essentially due to the condition of the fluids or humors of the body. As its etymology indicates, it refers to a discharge or a breaking forth of fluids,—thus describing the exudation of mucopurulent moisture in the case of coryza, in conjunctivitis, or in the case of an inflammation of other mucous cavities. Hence, catarrh in the minds of the originators of the term was not the symptom of a local disorder, but rather that of a blood disease or other constitutional disorder. This conception now filtered down to the rank and file of the people is being played upon and utilized by charlatans to bring about the sale of their "medicines." Such "medicines" are, of course, cheap concoctions (sold, however, at an exorbitant price) to tickle the palate and stimulate the appetite. Their value or danger depends entirely upon the condition of the individual who uses them. This condition can naturally be ascertained only by a trained physician; hence, the people are taking their own lives in their hands when they try to diagnose their own condition and prescribe the treatment.

Catarrh of the head is simply a chronic inflammation of the membranes of the nose. Sometimes this inflammation is due to lack of cleanliness and care. Again, it is due to the constant irritation from an atmosphere laden with smoke and dust. Sometimes the result of the continued inflammation is the thickening and overgrowth of the nasal membranes. This causes a hypertrophy of the glands which lie in this membrane, and there results an increase in the amount and a change in the character of the nasal secretions. In other cases the result of the inflammation is just the opposite, and the membrane is thinned and the secretion lessened—with a consequent dryness that produces an irritating itching. The treatment for such a condition is chiefly local, although any constitutional weakness should be looked after at the same time. That is, the cause of the continued inflammation must be removed by cleansing the cavities and keeping them clean, bony deformities and membranous growths must be removed, and a purer air must be sought out. One sees the worst cases of nasal catarrh in the children of poverty and dirt. These children usually sleep crowded together in small rooms which for fear of cold are kept tightly shut. For fear of the cold also the children are seldom bathed; almost never is there a daily cold bath given, and their skin, hair, and nails are but indexes of the condition of the nasal cavities. The physician sees such cases even in well-to-do families; but it is a curious fact that such people prefer to dose their children on everything from cod liver oil to worm medicine—and spend hundreds of dollars in doing it—rather than come down to sleeping with the windows open and taking a daily cold bath.

Catarrh of the throat is usually a continuation downward of that of the nose or "head." Once started it is very difficult to cure, and the best results are obtained from moving to a climate where the air is free from dust and smoke; and in cases of atrophic pharyngitis best to

one of considerable humidity; and in the hypertrophic variety to some high and dry climate. The smoke from the soft coal burners in our great cities is very irritating to inflamed throats; therefore, parents who can rear their children in the purer air of the country should always utilize the opportunity. For those who cannot change their location, soothing and antiseptic gargles will be found very helpful. Those who can afford it, usually pay frequent visits to the laryngologists and have their throats sprayed and irrigated.

Catarrh of the stomach usually results from such habits as the indulgence in alcoholic beverages or in highly spiced foods. One may say, however, that most of the cases of self-diagnosed gastric catarrh are simply cases of gastric neurosis,—of nervous fatigue showing itself in the stomach. Hence, the first step here is to have a correct diagnosis made. If the trouble prove to be gastric neurosis, then rest from worry and irritation will be the essential treatment. Should the patient have real gastric catarrh, then there is need to cleanse the interior of the organ thoroughly with solutions introduced through the stomach-tube, and to give the organ as much rest as possible while a new mucous membrane is being formed. For this reason, the stomachics and carminatives which give a temporary feeling of relief are dangerous, because they excite rather than soothe the gastric mucosa. In fact, drugs rarely benefit the condition. This drives one back to regulate properly the patient's food and exercise. The food best adapted to an acute case consists of peptonized milk, buttermilk, junket, etc. A little later raw and soft-boiled eggs may be added to the diet. Beef preparations stimulate the secretions and should, therefore, come later. A light mineral water, such as Vichy, will be found useful if taken a half hour before meals. Patients suffering from gastric catarrh should rest for half an hour after eating.

Catarrh of the bowels (chronic enteritis) is due to

similar causes. Constipation is also an important factor, especially in women. The same general condition of the mucosa being covered with a glairy mucous discharge prevails. The treatment is similar; but, because of the inaccessibility of the inflamed surfaces, harder to carry out, and consists in cleansing and keeping clean the inflamed surface, and in allowing rest to the entire bowel until the mucosa regenerates. The bowel should be irrigated with high colonic flushings (which, of course, reach only the colon) and cleansed by gentle laxatives, and the food made as non-irritant as possible. Predigested foods free from masses of indigestible fiber are probably best. To effect a cure, massage, rest, dieting, baths—in fact, such treatment as an institution alone can give—must be employed.

Similarly, we find people speaking of catarrh of the urinary and generative organs, when there is meant what the physician would call a chronic inflammation with excessive discharge. The same principles of local treatment hold good.

Asthma.

Asthma is another popular term needing some elucidation. It is really only a symptom and is caused by three, at least, quite different conditions. It may be described as a condition of difficult breathing, wherein the obstruction to the free passage of air lies in the narrowing of the lumen of the smaller bronchioles. The medical term for difficult breathing is dyspnea. Therefore, asthma may be spoken of as that form of dyspnea wherein the bronchial tubes suffer a spasmodic contraction. The objective symptoms are the cough and whistling of the air through the bronchioles. The subjective symptoms are the feeling of suffocation and weight on the chest.

Bronchial asthma is the form attending a bronchitis, or inflammation of the lining membranes of the bronchioles. In this form one can hear the labored breathing and

the whistling of the breath several feet away from the sufferer. This form is apt to become chronic and incurable through the changes that take place in the walls of the bronchioles. (See "Bronchiectasis" and "Emphysema.") However, the disease itself rarely causes death. Attacks of asthma are caused or excited by dust in the air, by sudden changes of weather, and by nasal troubles. The treatment of an attack is usually to burn powders of cubeb, stramonium, potassium nitrate, and similar drugs in the room until the vapors soothe the excited membranes. Sometimes, steam saturated with oil of eucalyptus, generated as described for throat diseases, is effective. A change of climate is usually necessary for a cure. Wherever he live, the patient should avoid a neighborhood the air of which is filled with smoke or dust.

Cardiac asthma is the result of the failure of the heart to pump the blood to and from the lungs steadily and rapidly. Its exciting cause is then a stasis of the blood in the lungs, while its primary cause is some form of heart disease. Myocarditis, an affection undreamed of by the patient, is usually found when an asthma of this type brings the patient to the doctor. Here, of course, relief is given by stimulating the heart; and such symptomatic treatment as the burning of stramonium in the room is out of place. The patient should be put to bed with an ice-bag over the chest. A hypodermic injection of a fiftieth grain of nitroglycerin is good emergency treatment.

Reflex asthma is often caused by some disease of the nose. This form is closely allied to hay fever. A spur of bone or an hypertrophy of the mucous membrane obstructing the free passage of air through the nose is a quite common cause. Usually, therefore, a rhinologist can do much toward curing this form of disease. Relief from an attack can often be obtained by spraying the nose with an oil solution of cocain, chloretone, adrenalin, and similar drugs.

It has generally been found that there is a nervous temperament back of asthma. This means that the cure of the condition depends greatly upon the attitude of the mind, and the condition of the nerves of the patient. The disease, therefore, is liable to recur, unless it be strictly organic in origin.

CHAPTER XXVIII.

CONSTIPATION.

One of the most annoying of physical irregularities is constipation. In a large proportion of cases it is due to the habits of life. For instance, modern society demands of women a style of dress that imprisons and to all intents and purposes paralyzes the abdominal muscles; and yet it is on the healthy action of these muscles that the normal excretion of waste products by way of the bowel chiefly depends. Again, the concentrated and prepared foods of the day have very little in them to stimulate the peristalsis of the intestines and thus bring about regular evacuations. For our bodies were developed into their present form by ancestors who ate coarse food; food which required much gnawing and chewing, and which yielded a large amount of waste material to fill up and stimulate the bowel. They ate at irregular intervals and great quantities. We eat frequently and small quantities. They needed a large amount of storage room. We need almost none. It is probable that in the course of ages the law of adaptation or of the survival of the fittest will bring about a race fitted to these changed conditions of life; but the present generation must give some attention to these matters and by artificial means do what nature has not yet learned to do.

In the first place, the children should be taught good habits. These include the thorough mastication of food (the habit of eating slowly and chewing well, if you please), a healthy development of the abdominal muscles, and the going to stool at a regular time each day. To assist in teaching the careful mastication of food, children should not be allowed to drink at meals, and should become accustomed to eat dry breads and similar foods. To illustrate, the writer has seen boys and girls cram their mouths with food and then wash it all into their stomachs with huge gulps of water, without any mastication at all. This habit cannot help producing digestive troubles later on. Again, free exercise in the outdoor air will help both boys and girls obtain a better development of the muscles of the trunk than any amount of proper sitting about indoors could give. The prudery that keeps a girl of eight to twelve years of age perched in a chair learning to sew or knit or play with dolls or practising on the piano, while her brother is enjoying a romp out of doors is to be condemned. And, finally, both children and adults should make it a habit to look for an evacuation of the bowels before leaving home in the morning.

Constipation is really the cause of very many diseases not associated with it in the popular mind. Thus gall-stones, jaundice, appendicitis, enteritis, hemorrhoids, typhoid fever, etc., are assisted into being by habitual constipation. Even old age and its feebleness are in part at least due to the absorption of poisons generated by the fermentation of food in the large bowel.

Treatment.—Any method of combatting constipation must take cognizance of three elements of cure: (1) A development of the muscular action of the abdomen and bowel, (2) an increase in the supply of fluid within the bowel, and (3) a regulation of the habits and diet so that sleep and rest shall regularly alternate with waking and work.

Drugs, then, are merely temporary expedients used to

overcome the results of bad habits and to get the bowels into a proper condition for this regulation of the habits, and the development of the body to take its effect. However, most patients wish some drug or charm which will overcome constipation but permit them to go on in their same old lazy, torpid and unnatural mode of life. Neither drugs nor mineral waters nor massage nor even electricity will quite take the place of active and energetic living in accord with the laws of health.

For active catharsis, castor oil in tablespoonful doses is probably safest. Epsom salts, in similar dosage, ranks next. Either of these may be repeated until the bowel movement occurs. For overnight laxatives, cascara sagrada is best. Of this, 15 to 25 drops of the fluid extract should be taken at bedtime.

Should one be directed by the physician to take mineral waters he will find it usually best to take the prescribed quantity the first thing on rising in the morning, at least one-half hour before breakfast. After swallowing the water the patient should, unless he be quite weak, promenade about until breakfast. Epsom salts taken in this way are quite as satisfactory as most of the mineral waters,—especially if charged with carbonic gas sufficient to form a briskly effervescing drink.

The cathartic salts are magnesium sulfate (Epsom salts), sodium sulfate (Glauber's salts), potassium and sodium tartrate (Rochelle salts). Aside from these in varying quantities in the mineral waters, we find sodium chlorid, or common table salt, traces of iron and the other metals, etc. For instance, the celebrated Carlsbad Sprudel salt contains:

Carbonate of lithia	0.20 per cent
Bicarbonate of soda	36.11 " "
Sulfate of potash	3.31 " "
Sulfate of soda	41.62 " "
Chlorid of sodium	18.19 " "
Fluorid of sodium	traces.
Borate of soda	0.03 " "
Anhydrid of silicic acid and oxid of iron, lime, magnesia	traces.

Therefore, in this water one obtains chiefly Glauber's salts and, except for the mental effect, one can obtain practically as good results by using combinations of the various cathartic salts.

But, in general, the cathartics soon become ineffective in that the bowel becomes so used to them that no increase in the peristalsis results from their presence. Hence it is better from the beginning to put the emphasis upon the development of good abdominal muscles and the correct habits in eating and resting and not depend at all upon the drugs.

The increased amount of fluid can be largely cared for by drinking more water. Thus, to drink half a glass of water every hour will prove very effective (in combination with muscular development and good habits), in setting up free evacuation of the bowels.

Of late years there has been preached the doctrine that daily enemata constitute a panacea for constipation. As we have tried to state above, we believe that nothing can take the place of the regulation of the life and diet. Hence we do not believe that patients should put their reliance entirely on rectal irrigation. Its danger is that it tends to weaken the natural efforts at peristalsis, and therefore renders the patient more and more dependent upon it for freedom from colonic stagnation. On the other hand, we believe that rectal flushing is one of the best methods of clearing out the colon, when nature has proven herself unable to accomplish the task. Therefore, between the evils of strong cathartics and those of the daily enema, we would choose for our patients the enema. Simple sterile water—that is, water from the boiler that has been cooled without the addition of tap water—is the best solution. When more active results are desired, a strong soapsuds is effective.

Of the measures which the nurse can execute, abdominal massage is perhaps the most effective. The nurse places her flat hand over the right iliac fossa and begins a circular

motion in the direction of the hands of the clock, with a radius of two inches. Continuing this motion, she moves her hands gradually up toward the liver, then across the epigastrium and down the left side. She should keep this up for about fifteen minutes.

The patient herself can strengthen her abdominal muscles greatly by carrying out a few exercises. The first is to lie flat on her back, preferably on a hard surface, like the floor, and raise each leg in alternation, to the vertical without taking hold of any support with her hands. This should be kept up for at least five minutes. The second exercise is to press in with both hands over the abdomen round about the navel, then force out the indentation by taking a deep breath and contracting the abdominal muscles. This exercise should be worked over at least twice a day for about five minutes each time. The rolling of a six-pound cannon-ball over the abdomen is another device for exciting peristalsis and strengthening the muscles. The ball should be rolled in the direction of the colon; *i. e.*, from the right iliac fossa up close to the ribs, across the abdomen and down the left side.

CHAPTER XXIX.

LIVER TROUBLES.

The liver is the largest gland in the body. It is also the only solid gland. Its function seems to be chiefly the storing up of food products such as sugar and iron, the working over into nontoxic compounds some of the products of katabolism brought from the muscles and other structures, and the production of bile. When its work of storing up sugar does not go aright, we find sugar in the urine and the body suffering great emaciation. When it

does not break down the proteid compounds (such as uric acid), we find evidences of their affecting various tissues of the body in the symptoms of excruciating pain, and convulsions. When the bile is not properly produced and delivered to the intestine, we find the skin becoming yellow and the patient sleepy and lethargic.

The most common disease originating in the liver is that last referred to, namely, **jaundice.** Its chief symptom is the yellow pigmentation of the sclera of the eye, the mucous surfaces, and the skin, due to the infiltration of these tissues with bile-salts. It is usually caused by the obstruction of the bile-ducts leading from the liver to the gall-bladder, or of that from the gall-bladder to the duodenum. This obstruction may be caused by gall-stones or by an inflammation of the bladder (cholecystitis) and ducts themselves (cholangitis). This obstruction causes the bile to be dammed up and infiltrate the liver itself, and be thus absorbed by the blood. The origin of the inflammation of the bile-ducts, and of gall-stones, for that matter, is an infection usually creeping upward from the duodenum. This occurs more usually in constipation. Jaundice (icterus), when not caused by the gall-stones, gives very little pain; and its symptoms are headache, jaundice, indigestion, and lethargy. Sometimes there is a low fever. When caused by gall-stones, the jaundice may be accompanied by gall-stone colic with its excruciating pain. Jaundice of either type frequently clears up of itself, after a thorough cleansing of the bowel; but the inflammation leaves a damaged membrane with a tendency to inflammation and to the formation of gall-stones; and the disorder once set up rarely ceases until the gall-bladder is opened and drained, or the patient dies. The treatment of the attack calls for hot baths, cathartics, deep massage over the liver, rest, and light diet.

Gall-stone colic is caused by the distention of the ducts and gall-bladder with gall-stones and bile. The

latter may have become thickened or purulent. If purulent, then there is apt to be irregular fever accompanied by chills. Sometimes nature succeeds in walling off the stones and in forcing a passage to the intestine; sometimes they even ulcerate through into the intestine direct; but usually, unless operative procedure is adopted, the patient goes on suffering discomfort and pain until he dies. The treatment during the attack is the application of hot cloths and water bags to permit the relaxation of the tissues and the possible passage of the stones through the ducts, and the giving of anodynes of the strongest sort to overcome the pain.

Biliousness is the popular term for a condition of bowel sluggishness, possibly a mild enteritis, accompanied by more or less inactivity on the part of the liver. That is, the general feeling of lassitude and headache is probably due to an overcharging of the circulation with the waste products of the body's activity. Its treatment consists in exciting the peristalsis by calomel and other cathartics, the cleansing of the pores and glands of the skin by sweat baths, the regulation of the diet, and an increase in the patient's outdoor exercise.

Cirrhosis of the liver is an organic disease of the liver itself. It is found in alcoholics and those who have been subjected to great strain and overexertion. The glandular substance of the liver atrophies and its place is taken by connective tissue. The symptoms are due to the interference with the portal circulation, stasis of the blood in the stomach and intestines, ascites, dilatation of the heart, etc. The congestion of the blood in the stomach and bowels of course sets up all sorts of indigestion and bowel irregularities. The other symptoms are those due to the failure of the liver to do its work. These are headache and nervous symptoms, convulsions, and neuralgias. The course of the disease is chronic and ends in death.

Acute yellow atrophy of the liver is found as a result of overwhelming toxic influences. In our climate phos-

phorous poisoning produces a condition very similar to that found in real yellow atrophy.

There are two or three **parasites** affecting the liver, the chief of which is the echinococcus cyst. (See "Intestinal Parasites.") This sometimes causes jaundice and other evidences of the obstruction to the flow of the bile. The liver is enlarged and the patient suffers from indigestion and other disorders.

Cancer of the liver quite often is secondary to that of the stomach or other neighboring organ. Hence, its removal is impossible and the prognosis is *pessima.*

CHAPTER XXX.

KIDNEY DISEASES.

Richard Bright was the first to publish (in 1828) a complete study of the pathologic conditions of the kidneys and their symptoms; and it has, therefore, come about that any disease of the kidney, whether acute or chronic, is called by the laity Bright's disease. The medical world uses the term nephritis to cover the inflammations of the kidney, nephrolithiasis for stone in the kidney, pyelitis for an abscess in the pelvis of the kidney, and nephrosis as a general term for any affection of the kidney.

The kidney suffers practically the same sorts of lesions as the other organs. Thus, we have acute inflammation due to infection brought to it by the blood-current; hemorrhage due to trauma, or corrosive poisoning, etc., chronic inflammation resulting from the subsidence of acute inflammations or from the long continuance of small irritations. These chronic inflammations may be either in the secreting glands of the kidney or in the blood-vessels or their connective tissue. In the former case we speak of parenchymatous nephritis; in the latter, of

interstitial. The irritant drugs, such as turpentine, chlorate of potash, cayenne pepper, and the Spanish fly (cantharides), and the antiseptics such as carbolic acid, have the tendency to set up acute inflammation of the kidney when given in quantity. Sometimes a severe chilling of the body will produce the same acute inflammation. In this form of the disease either the kidney does not secrete at all (and we have anuria), or it secretes an albuminous and bloody fluid. Such acute attacks may also occur in the course of acute infectious diseases, such as scarlet fever and malaria, and also in the course of pregnancy. The symptoms are chiefly the pain and character of the urine. The latter is scanty, smoky in color, and full of blood and albumen. The course under proper care is limited to a few days. The result (unless the patient die at once from uremia) is either a complete cure or the establishment of a chronic disease.

In our modern life we are living under such pressure, we are eating so much of preservatives in our food, we are taking so many stimulants (especially alcoholic), that the chronic forms of nephritis seem increasingly frequent. They begin so insidiously that the patient does not know of his trouble until it is fully developed. The symptoms then are dyspepsia of various types, edema of the feet and legs, headaches, etc. Later on, the heart also becomes affected, and the circulation gradually fails. The urinary findings vary with the type of inflammation and the stage. Thus, chronic parenchymatous nephritis produces a scanty urine of high specific gravity, and loaded with albumen. The urine in chronic interstitial nephritis, however, is plentiful, of low specific gravity (1005 to 1012), and contains very little albumen. The finding of casts of the kidney tubules, or of kidney epithelium with the microscope is generally of greater diagnostic value than the quantity of albumen. The kidneys affected gradually change in the course of the disease, and while the intermediate stages differ, the end results are quite similar;

the secreting cells are greatly decreased in number, and the kidney made up chiefly of connective tissue. It becomes, therefore, a hard, gristly, useless organ.

In any form of nephritis it is important to know how much of the actual waste products of the body the kidneys are actually excreting. Therefore the nurse should carefully measure the total quantity of urine passed in twenty-four hours, and should submit samples from all the different voidings (in order that the pathologist may have a fairly correct average) so that the quantity of urea can be estimated. This substance represents the used-up proteid of the body, and is also the broken up remains of what would prove very poisonous to the system if allowed to remain. Naturally, the nurse must exercise great tact and skill in securing the specimens of urine without contamination, and in sterile vessels. When the nurse is asked to make preliminary examinations of the urine for albumen and sugar, she can best do so with the following simple heat tests: Pour an inch of urine into a test-tube and boil it in the flame (shaking the tube constantly). If the fluid becomes cloudy (white), she should add three or four drops of nitric acid. If the urine then becomes clear again, there is little or no albumen present. To test for sugar, she should render the urine just alkaline with sodium hydroxid solution and then boil as before. A brown precipitate indicates sugar. In determining the reaction of the urine, we moisten in the urine a strip of blue litmus paper, which becomes red when wet by acid urine, and blue when wet by the alkaline urine. The normal urine should, of course, be acid. It becomes alkaline on standing in a warm place, and also by fermentation in the bladder (as in cystitis), even if it were acid when secreted by the kidney. For this reason, urine being saved for the pathologist should be kept in an ice-box or preserved with three or four drops of formalin or chloroform. Mucus and strings in the urine usually come from the bladder or from outside contamination.

A chronic nephritis may not cause death for years. The future of the patient generally depends upon his course of life; if he overwork either mind or body or if he overeat or overdrink or if he be attacked by some acute disease, his chances are small for a long and happy life.

Pyelitis, and **pyelonephrosis,** or infected kidney, can sometimes be helped by drugs. Generally, they represent an infection ascending from the bladder, but may also be caused by germs circulating in the blood. If at all persistent, an abscess is formed and the kidney must be opened and drained. The acute inflammations of the kidney in the course of infectious diseases are due usually not to the microbes themselves but to their toxins. Hence, such inflammations do not usually lead to abscess formation and surgical interference.

Stone in the kidney demands, of course, surgical interference. It may have started in an infection which changed the character of the secretions and caused the salts normally held in solution to be precipitated and a concrement formed. Such a concrement may pass for years unnoticed until its size causes it to block up the ducts, or a concomitant inflammation weaken the whole kidney.

Inflammation of the bladder, or **cystitis,** usually comes up from below, and rarely down from the kidney. It gives pain and fever, and renders the urine alkaline. Practically always infectious (*i. e.*, from gonorrhea, tuberculosis, etc.), it demands irrigation with antiseptics (*e. g.*, potassium permanganate 1 : 4000) from the urethra, and also the giving of antiseptics by the mouth to keep the ureters free. Antiseptics for this latter purpose are salol, hexamethylenamin, and methylene blue.

Vigorously treated, a cystitis should give way in a week or two. The patient, of course, must be kept quiet, as in disease of the kidney itself.

Treatment.—The principle on which nephritis should be treated is that of protection from chills and irritants. The amount of work to be done by the kidney should be

reduced by putting the patient to bed and keeping him quiet. Even in bed attention should be given to his being kept warm. All irritant food should be laid aside. This includes alcoholic drinks, spices and condiments (including salt), and rich meats. The patient should not be fed more than is needful for life. The next step is to keep waste products from accumulating in the system. This is accomplished by keeping the bowels very free and by making the patient perspire freely. Water may be given freely, and generally it is well to give some at least in the form of mineral water. This last point, however, must be settled in each case for itself.

The diet of the patient is chiefly milk. This can be served in various tempting forms, to give variety. The green vegetables also may be used—lettuce, beets, cauliflower, asparagus, tomatoes, etc. No overloading of the stomach should be permitted, therefore the frequent meal is better than the heavy one.

For a sweat bath the dry hot-air cabinet is better than hot packs or the steam bath. It can be arranged in a bed, as we have shown elsewhere, or the patient carried on a stretcher to the bathrooms.

CHAPTER XXXI.

HEART DISEASES.

In spite of the fact that the cause given in the newspapers for sudden deaths is frequently "heart disease," still there is no such disease entity. There are, however, several diseases of the heart. And it is because of the unfamiliarity of the public with these different pathologic conditions, and the difficulty encountered even by competent physicians in their diagnosis, that biographers utilize

so frequently the generic term "heart disease." The result of this practice has been that "heart disease" has become the haven of refuge for lazy and incompetent diagnosticians; and everything from cerebral hemorrhage to murder has been laid to the charge of heart disease.

The most common pathologic condition is a thickening and shrinking of the valves. The result is that the blood is not kept from regurgitating into the cavity supposed to be protected by that particular valve. Then follows an enlargement or dilatation of the overfilled cavity. Then the muscle thickens in an effort to expel the extra blood, and we have both dilatation and hypertrophy. The membrane of the valve itself may become filled with deposits of lime or it may be covered over with scar tissue. The effect is, of course, the same: the valve does not fit the opening. The symptoms are asthma (dyspnea) due to the damming up of the blood in the lungs, pulsation of the large veins of the neck, irregular or intermittent pulse, and cyanosis due to the overfilling of the skin capillaries, especially those of the face.

The valve most frequently attacked is the mitral—that leading from the atrium (or auricle) to the ventricle on the left side of the heart. Inasmuch as the left ventricle is the chamber that forces the blood through the body vessels, it is the largest and thickest of the heart muscles. It is attacked particularly often in rheumatism. The next frequently attacked is the semilunar valve, that shuts off the heart from the aorta. The valves on the right side are rarely attacked except secondarily to those on the left. Congenital lesions of the valves on the right side of course occur,—but the patients rarely live to grow up.

Ordinarily, attacks of valvular disease such as come from overexertion or from ordinary forms of rheumatism, are fatal practically only when the patient cannot take appropriate treatment. The lesions, of course, remain to limit the patient's ability to exert himself or overwork any of his organs. But gonorrheal rheumatism and the

suppurative diseases are apt to produce an ulcerative endocarditis or inflammation, which is generally fatal. The symptoms are similar to those of the simple form, but in graver degree.

The heart muscle may become diseased. This is *myocarditis*, as opposed to the endocarditis which we have just considered. This may occur in the course of a general infection, and be accompanied by an endocarditis. In such case the two diseases could not be distinguished while the patient is alive, although the second (myocarditis) renders the other without hope of recovery. If the myocarditis be suppurative, the prognosis is very bad. If subacute or chronic, life may be prolonged indefinitely under the proper regimen. Fatty degeneration of the heart muscle is fatal; the only question being the rapidity of the process. But fatty infiltration only renders the patient more liable to succumb to strain and acute disease, and is of itself not sufficient to cause death. A chronic inflammation of the cardiac muscle renders the patient short of breath, liable to dyspepsia, and edema, especially of the legs and feet. Other symptoms are hardly distinctive.

The outer membrane and the capsule containing the heart may become diseased. The two conditions are indistinguishable (because the membrane covering the capsule is continuous with that covering the heart itself) and are called by the one name, *pericarditis*. The disease causes the same sort of symptoms as the other heart diseases; namely, shortness of breath, indigestion, edema, etc. The cause is usually infection, though it may be due to a trauma. Here, again, acute articular rheumatism is the most frequent cause. Except when the disease is the result of terminal infection in nephritis or diabetes or similar disease (tuberculosis), it is not always fatal. It leaves behind it, however, adhesions and other unpleasant reminders of its being.

The whole heart seems under certain circumstances to

Fig. 28.—Varicose veins (case of Dr. J. W. Perkins).

suffer *acute dilatation.* One of these occasions is when running or performing exceptionally arduous labor. Again, dilatation seems to occur under nervous excitement. The condition is, of course, dangerous, and unless promptly overcome by rest and stimulation will lead to syncope and death.

Hypertrophy of the heart results from continued overwork, as in athletics, or from chronic overfeeding and stimulation, as in continued beer drinking. The heart, then, is immense and is called, for that reason, "ox-heart." The danger from this hypertrophy is two-fold: either the exercise is not kept up and the heart grows flabby and susceptible to strain; or acute disease (as pneumonia) attacks the system and the weakened heart succumbs.

Angina pectoris is a disease of the nervous mechanism of the heart and shows itself by a sharp pain starting from the heart and radiating down the arm. Its cause seems to be a contraction of the vessels supplying the heart with blood. The treatment, therefore, is to expand the blood-vessels and release the spasm by means of nitroglycerin or amyl nitrite. A pseudo-angina pectoris is quite frequent, and seems to be a manifestation of hysteria.

Arteriosclerosis is a disease in which the walls of the arteries gradually become hard and brittle. The result is a breaking of the wall when subjected to special strain. This hemorrhage, when in the vessels of the brain, causes what we call apoplexy. When arteriosclerosis has changed the walls of the aorta, an aneurysm is likely to result. A general arteriosclerosis produces a form of nephritis. The cause of arteriosclerosis has been charged to syphilis and high living. We can diagnose the condition frequently by the hardness of the radial artery as we roll it beneath our fingers in taking the pulse. The arteries cannot be restored to their former elasticity; therefore, the only treatment is to change the manner of living into a hygienic one, and to "move slowly and walk gently" for the rest of one's days.

An *aneurysm* is the bursting of the inner and middle coats of an artery, so that a pulsating tumor results. These tumors are liable to burst the outer coat also; and then, unless the artery be a very small one, death is the usual outcome. The principal place for aneurysms is in the arch of the aorta; and here its bursting means death. The cause is chiefly arteriosclerosis. Therefore, aneurysms show themselves when arteriosclerosis is at its height—from forty-five to sixty years of age. Their treatment is surgical, but even surgery can rarely accomplish much.

The heart generally shares in the suffering of nephritis and other diseases in which the poisons generated by the failure of the emunctories to act have accumulated in the body. Therefore, in the last days of chronic nephritis it is practically impossible to decide whether the nephritis or the valvular lesion was primary.

The **treatment** of diseases of the heart demands, first, the removal of all unnecessary load from the heart. Therefore the patient must be made to lie down and keep quiet. The next element is to regulate the action of the heart so that the most is accomplished with the least effort. It is usually necessary in order to do this to slow the action of the heart by applying ice or by giving digitalis or strophanthus. Sometimes the arteries have to be dilated or contracted in order to ease up the heart; this is accomplished by the use of heat for relaxation and cold for contraction; or of nitroglycerin for expansion and of ergot or adrenalin for contraction.

To apply the ice-bag to the chest the nurse should secure if possible a bag with an outlet for the melted water. The ice-bag should not lie with the rubber against the skin, nor should its whole weight be on the chest. It is better to suspend the bag over the patient.

The extremities need frequent and careful massage to keep the circulation in good order. In massaging patients with heart disease the nurse should avoid shaking or otherwise disturbing the patient.

Fig. 29.—Application of ice-bag to chest; extemporized method of support.

The patient's digestion will require extra and skilful attention. The diet should be light but nourishing, and given in small but frequent meals. Steak and toast are well adapted for the first few days after putting to bed. Frequently hydrochloric acid should be given after food (of the dilute acid, give 10 to 15 drops in water).

The bowels require daily evacuation. The mineral salts assisted by calomel should be used regularly and helped out by an occasional enema.

The nurse should study the character of the patient's pulse, and when any changes occur, notify the physician. The water hammer pulse, the galloping pulse, the irregular pulse, and the intermittent pulse need to be studied and differentiated for this purpose.

CHAPTER XXXII.

GOITER AND OTHER DISEASES OF THE DUCTLESS GLANDS.

A gland consists typically of a group of epithelial cells which select from the blood stream flowing along one side of them certain materials, and then either discharge these materials unchanged into the duct with which they are connected, or else work them over into a new compound and discharge this compound either into a special duct or back into the blood-stream. Thus, the large glands about the mouth manufacture from material taken from the blood, saliva, and discharge this through special ducts into the mouth. So, also, the kidneys take up water and urea, and various salts from the blood, and manufacture urine, which is then discharged drop by drop into the ureters and thence into the bladder and urethra. Again, the liver manufactures among other things, bile, and

sends this through long ducts into the intestine, a few fingers' breadth from the outlet of the stomach.

But, of the other type of glands which have no ducts but which turn their products back into the blood-stream, we know less. The investigation is still going on, and every year we are adding new facts to our physiology. Thus, only recently we learned that the suprarenal capsules—bodies lying near the kidneys and supposed for a long time to be merely vestigial remains—manufacture a principle which is the most powerful astringent to the walls of our blood-vessels known. So, also, we have learned that the thyroid gland in the neck is not only the factory for an iodin antiseptic for the blood but that it also plays an important rôle in the fat metabolism of the body. Because the secretions of the glands are sent back into the blood and not into the special ducts, they are called internal secretions. In this connection it is interesting to note that there is a growing belief that the kidneys and other glands possessed of ducts nevertheless have internal secretions also that cause chemical changes to take place in the material floating in the blood.

Of the diseases of the ductless glands **goiter** seems to be the most common. In Switzerland and in other hilly regions every other person, in fact, has a "thick neck." The disease is, of course, one of the thyroid gland. But an enlargement of the thyroid gland may not always mean an increase in the secreting power of the gland. In fact, it usually means just the opposite. Thus, the apparent size may be due to a neoplasm within the capsule of the thyroid; or part of the gland may have degenerated into a mass of fatty material or even into a deposit of lime. Again, great cysts may form within the gland. Therefore, as far as the symptoms are concerned, they depend not on the apparent size of the gland, but rather on whether there is an over- or under-secretion of the thyroid material. If there is an over-secretion, we find the patient very thin and nervous, the pulse and respiration rapid, and the eyes

more or less bulging. On the other hand, an under-secretion produces a lethargy, a dulness of intellect and a slowness of movement called (because of the appearance of the skin accompanying the disease) myxedema. The skin is thickened and putty-like. If the patient be a child, the growth is stunted—both of the body and the mind. The eyes are dull, the lips thick, the hair coarse, etc. When the condition is congenital, the patient is what is called a cretin. The contrasting condition, or hyperthyroidism, is called Graves' or Basedow's disease (exophthalmic goiter), from the names of the physicians who first described it. Of course, either condition is hopeless unless surgical intervention is accepted, and the degenerated part of the gland, or the parasitic growth, removed. If, then, there is not enough of the gland remaining to supply the secretion, the extract of sheep's thyroid glands must be fed to the patient. Since the disease is surgical, no special directions need be given for caring for the disease, except that in feeding glandular extracts much better results are obtained when the extract is given on an empty stomach and no food given (or even drink) for an hour. The reason for this is that in order to be benefitted the patient must absorb the extract into his blood-vessels unchanged, and naturally if the digestive juices were very active when the extract were put in the stomach, they would digest the extract also. Hence, the chewing of gum (or tobacco) while one is taking the extract is bad. Sometimes in treating patients who cannot be controlled or where very prompt results are sought, the remedy is injected under the skin. Inasmuch as the cause of the disease seems to be local (or endemic), it is wise for anyone noticing the beginning of a goiter to change his residence; especially from a mountain into the valley.

Addison's disease is a degeneration or disease of the adrenal bodies. This is frequently caused by a tuberculous process attacking the gland, but the pathology in general is unknown. The symptoms are chiefly a brown-

ish pigmentation of the skin, a general weakness, and very pronounced digestive disturbances. We know that these general symptoms are due to a lack of the secretions in the blood of the adrenal bodies. Therefore, the treatment is very simple: supply adrenal extract taken from animals. As long as this is done the patient gets on well. The same attention to the time of giving the extract, and the emptiness of the stomach, must be observed here as in hypothyroidism.

Acromegaly seems to be due to a disease of the pituitary body lying just underneath the brain in the skull. Its chief symptom is an abnormal enlargement of the bones, particularly of the jaw. Next in frequency comes the enlargement of one or both hands, then of the feet. The overlying tissues appear normal but thickened. Fortunately, very few other symptoms are noted, and the patient suffers comparatively little discomfort. If the disease seems to be progressing, we can try to obtain some pituitary extract and give it. Little, however, has been accomplished in this direction.

Considerable assistance will be afforded the patients in their efforts to correct the metabolism of their bodies, if they are given hydrotherapeutic treatment, including massage, and are taught to follow a hygienic mode of life.

Diabetes mellitus is in the opinion of some due to a disease of the glands. Thus, the islands of Langerhans in the pancreas are found changed in this disease. Others, however, lay the charge of causing the disease to the liver. (See Chapter XXIII.)

CHAPTER XXXIII.

NERVOUS DISEASES.

The increasing number of sanatoria for the nervous and the overflowing hospitals for mental diseases testify to the growing realization of the need of scientific care of patients suffering from nervous and mental disorders. It would seem also that these disorders are on the increase. In these diseases the nursing is important, because it is not the medicine given, but the diet, the care, and the environment which have the greatest influence on the condition of a nervous wreck.

The nervous system is the last part of our bodies to develop; and is therefore particularly susceptible to overstrain or misuse. It is the most complicated part of our corporeal machinery, and for that reason, also, is most likely to get out of order. Fortunately, however, nature will herself usually make the repairs if given the chance. That "chance" usually is found when the patient is given both mental and physical rest. This rest can be obtained in most cases only when the patient is removed from all his ordinary surroundings and put where he has not a care or a worry or a responsibility.

The symptoms of general nervousness and of functional nervous diseases in general are usually headache and backache—aside from irritability of temper and other mental symptoms. Thus, neurasthenia, or nervous exhaustion, carries with it not only these symptoms but also a dislike for exertion either physical or mental. The digestion is, of course, deranged, the appetite capricious, and the bowels sluggish. Pains are apt to appear anywhere and everywhere in the body, and all sorts of diseases will be simulated.

There is, however, another class of nervous disorders

which must be differentiated from those referred to above, and these are the organic, or diseases due to some demonstrable lesion in the nervous system. Hence, we say that nervous disorders must be classified as either functional or organic. "Nervousness" and hysteria are, of course, merely functional disorders, due as we have intimated to the overstrain (especially where there is a congenital weakness) of the nervous system.

Of the organic diseases the most notable are apoplexy, myelitis, tabes dorsalis, neuritis, meningitis, and tumors.

Apoplexy is due to the bursting of a small blood-vessel in the brain, and the consequent formation of a clot which presses upon the surrounding nerve-centers and stops their activity. The cause of such a hemorrhage may be arteriosclerosis, leading to the weakness of the walls of the blood-vessels, or it may be a sudden congestion of the brain so overfilling with blood the capillaries that they can no longer stand the strain. The result of such a hemorrhage is, of course, the so-called stroke of paralysis, wherein the patient cannot use the muscles supplied by the nerve-center pressed upon by the clot. Ordinarily, we expect to find in such a patient some disease such as syphilis or obesity, which has been for years undermining the health of the vessel walls. If, now, no more hemorrhages occur and the blood-clot is absorbed within reasonable time, then the paralysis passes away and the patient recovers—recovers in the sense that his weakened arteries are able to withstand moderate pressure.

Myelitis is an inflammation of the spinal cord, due either to injury (such as a blow or a fall) or to infection (as from the bacillus of influenza). This, of course, produces a partial paralysis, in that the nerve-fibers within the area of inflammation become inactive and loss of sensation and motion in the parts supplied by these nerves result. In this disease, unfortunately, connective tissue seems to replace the nerve-tissue destroyed by the inflammation, so that it is not a matter of regaining one's original

strength after the inflammation subsides, for if the nerve-paths ever regenerate at all, it is not to their original fullness. Hence, degeneration of the muscles supplied by the affected nerves is apt to result. Infants seem specially susceptible to this form of inflammation, and carry with them through life its marks in the form of dragging feet or weakened arms.

Tabes dorsalis is also called locomotor ataxia, because of the inability of its victims to walk naturally. It is a degeneration of some of the nerve-paths (bundles of Goll and Burdach in the posterior horns) in the spinal cord, and therefore is characterized by changes in and loss of the normal reaction to light of the pupil of the eye (Argyll-Robertson pupil). The patient loses his power to stand quiet with his eyes shut and his feet close together (Romberg's sign). There are abdominal pains which may be mistaken for various kinds of colic. Finally, the inability to place the foot easily and steadily in place when walking occurs,—at each step the foot is lifted higher than necessary and the heel hangs downward in making the swing. The disease lasts for years, and while it rarely kills outright, so weakens the patient that he is apt to die from pneumonia or other acute infection. The best treatment is the training of new nerve-paths to take the place of the degenerated ones. This, of course, takes months of effort under the most competent direction. The cause of tabes dorsalis is in a large percentage of cases syphilis, acquired some ten or fifteen years before the outbreak of the nerve trouble.

Meningitis is an inflammation of the coverings or capsules of the brain. If the outer covering, or dura mater, alone be attacked the disease is called pachymeningitis,—if the inner coat, or pia mater, be the seat of the trouble, it is leptomeningitis. Usually, however, severe forms attack both layers. We find several forms of meningitis, when classified as to causation, as follows: epidemic

cerebrospinal meningitis, syphilitic meningitis, alcoholic meningitis, secondary or septic meningitis (this last form follows pneumonia, diphtheria, otitis media, and other acute infectious diseases), infantile meningitis, and chronic meningitis. The differential diagnosis need not concern us here. The mortality varies in the different types—from tuberculous meningitis, which is practically always fatal, to syphilitic meningitis, in which practically all the cases treated aright recover. The symptoms vary according to the part of the brain seized upon by the disease. The general symptoms are headache of a boring character, backache, causeless vomiting, painful cervical and dorsal rigidity, hyperesthesia, etc. Moderate fever is usually present in the acute forms. Severe cases are marked by delirium and coma. The disease attacks chiefly infants and children; and it is a suspicious symptom when the child suffering from fever, who might not be able to explain his symptoms in words, bores his head backward into the pillow. Quite often there is a piercing, inarticulate cry characteristic of the disease. There is generally also an inability to flex the thigh on the abdomen. (Kernig's sign. See "Disorders of Infancy.") Another means of ascertaining the character of the disorder is the lumbar puncture: A hollow needle is inserted between the second and third, or the third and fourth lumbar vertebræ, and the fluid thus obtained is examined. While making this puncture it should be noted whether the pressure is small or great and whether the fluid is clear or cloudy, as it comes out. The nurse should have the patient on his side with the back bent to give the maximum dorsal curve and the whole space between the last dorsal vertebra and the sacrum sterilized ready for the operation. Of course, in meningitis the tongue is coated, the bowels constipated, and the general signs of a disorganization of the body functions present. Some forms of meningitis may last for months, but generally the fate of the patient is settled in a few days. The particular treatment needed

is absolute quiet, with the ice-bag at the head. The drug treatment varies, of course, with the cause.

Hydrocephalus is more properly a disorder of infancy and is there considered. There is, however, once in a while a case of adult hydrocephalus not secondary to brain tumor. It is almost impossible to make a diagnosis from the symptoms, which are headache, recurring attacks of coma, optic neuritis, etc., because they occur in other cranial disorders also. The sutures of the skull may not be at all separated.

Epilepsy is more properly classified under insanity, because it affects the mentality of the patient and renders him unfit to live at large. It is a disease of unknown pathology, though it seems to find its predisposition in bad heredity (alcoholism, drug habits, insanity, etc., in the parents). The characteristic symptoms are attacks of unconsciousness. If the disease be of the grand mal type, these attacks may last some minutes and be accompanied by frothing at the mouth, biting of the tongue, and involuntary ejection of urine and feces. If the disease be of the petit mal type, the attacks are but flitting attacks of unconsciousness—so short indeed that the patient does not fall but simply pauses in whatever he is doing and then after a moment goes on with his work. The memory is one of the faculties earliest affected, and this is often that which brings the patient to the doctor. When the epileptic attacks begin in early youth, the prognosis is not as good as it is for the cases beginning in adult life, because it shows that the whole nervous system is relatively weaker than in the other class of cases. The treatment for the disorder is to remove the patient from all responsibility and worry to a place where he may live out of doors and do light work whenever he feels able. The farm colonies for the treatment of epilepsy are therefore proving quite successful.

Another form of epilepsy, which sheds some light on the general nature of the disease, is the surgical or *Jacksonian*

epilepsy. In this the attack always begins in a twitching of one set of muscles (as, for instance, those of the right thumb or those of the lip). Here we find a tumor or something similar exerting pressure on the cerebral centers which control those muscles. Therefore, when this pressure is removed by surgical means, the patient is relieved of his seizures. This leads us to infer that epilepsy really consists in some interference with the cerebral centers.

During an epileptic attack the patient should be stretched on his back, given plenty of fresh air, and his chest and abdomen relieved of constricting clothing. His return to consciousness is usually unhindered.

Sometimes epileptiform seizures are caused by reflex troubles. Thus, in the female, a hooded clitoris or some other malformation of the urogenital organs will bring on regular attacks in young children. Similarly, in the male, a long foreskin and the consequent uncleanness of the glans penis will have the same result. Even spasmodic contractions of the sphincter muscles may have these results. Naturally, therefore, all children suffering from "fits" should be examined not only for intestinal worms, but also for such deformities and contractures as those instanced.

Migraine is in many ways a reminder of epilepsy. It is a regularly recurring one-sided headache, of such intensity that the patient must lie absolutely quiet in a darkened room for two or three days and have anodynes administered. In all probability it is due to an insufficiency of the liver, in that this gland does not break down into simpler products ready for excretion through the kidneys all the poisonous waste products gathered up from the various parts of the body by the blood-current. When these products accumulate in sufficient quantities to poison the nerve-centers and interrupt the smooth running of the body machinery, an attack of migraine results. The vomiting, the sweating, and the purging incident to the attack cleanse the body of these offensive

matters, and life goes on once more until a new accumulation induces another attack. In children the regular recurrence of seasons of vomiting (cyclic vomiting) is an equivalent for what may become migraine in later life.

The treatment of either cyclic vomiting or migraine is, of course, the stimulation of the liver and the keeping the intestinal tract free and clean, coupled with free exercise out of doors. Such patients should not be allowed to do much confining mental work. During an attack of migraine, the bowels should be fully purged by mineral waters and by enemata. The stomach should not be burdened with food. Sweating (including the drinking of considerable water) will help to shorten the attack.

Neuritis is an inflammation of the peripheral nerves. It differs from neuralgia only in the cause of the pain,—in neuritis the pain is due to the inflammation of the nerve itself. In neuralgia the pain may be due to changes in the nerve substance, but is more often due to pressure from surrounding tissues, and similar causes. It attacks most frequently the nerves of the thigh (sciatic) and shoulder (brachial plexus). It is attended by great pain on movement, and on changes in the environment from heat to cold. There is a tendency toward degeneration of the nerve-fibers involved, but most cases recover and almost no deaths occur from the neuritis itself. The cause is a toxic one. Thus, chronic lead poisoning shows itself in a neuritis; so does chronic alcoholism. Probably many cases are due to toxins absorbed from the intestinal tract in cases of constipation and intestinal infection. The treatment is tedious and consists of rest in bed, hot baths (dry air), etc. No massage or electricity should be used at the beginning. Later, however, they will shorten convalescence.

Neuralgia is sometimes relieved by pressure, while neuritis is made worse by pressure. Neuralgia usually attacks the fifth cranial and the intercostal nerves, instead of those of the extremities. It is usually caused by chilling or by pressure upon the nerve-trunk.

When the causes are removed, the patient rapidly recovers. Rest and heat are the sovereign remedies.

The brain is subject to **tumors,** the same as the rest of the body. They cause headache and a disturbance of the function of the parts supplied by the corresponding nerves. This disturbance is usually in the form of convulsions, followed later by paralysis. Other symptoms are found in the eyes, which show the effect of interference with the nerve-centers in almost any part of the brain. Since these tumors are fatal unless they can be removed, the matter of their treatment becomes simply a matter of relieving the patient of pain and distress until the surgeon can operate.

The treatment in general for all organic lesions is to keep the patient quiet and relieve the distress. This latter can sometimes be accomplished by the use of heat, either in the form of local applications or hot-air baths, but quite generally it requires powerful drugs. During all this time the nurse must keep the patient's body in good condition by massage, very careful feeding of very nutritious and easily digested foods, such as peptonized milk and eggs, custards, junkets, scraped steak, etc., and by keeping the bowel clean by the use of enemata (if the physician does not wish to use cathartics).

When we discuss **functional nervous disorders** we find ourselves dealing with one of the most unsatisfactory phases of modern medicine. Here, the mental and physical are so thoroughly interwoven that it is almost impossible to discern whether we are dealing with symptoms resulting from mental worry and anxiety or from physical disorders. These conditions are the more common in modern American life because the whole atmosphere is leading us to look upon ease and pleasure as the inalienable rights of every human being. Since it is inconceivable that such a condition as complete success and satisfaction can exist for every one as long as the ideals of men and women are essentially selfish and self-

seeking, we must expect every one of us to meet failures and disappointments. In other words, a large amount of nervousness is engendered by the striving for the impossible. Observation leads one to believe that a great deal of the present prevalence of nervous troubles would disappear if our people would only get back into the frame of mind of our Puritan ancestors, and look upon this life as a workshop rather than as a pleasure garden, and seek to do the most good possible rather than to receive the greatest amount of pleasure.

Neurasthenia is used by the laity to cover too many different types of nervousness. The term *hysteria* would better fit the condition of many so-called neurasthenics. The former refers properly to the nervous exhaustion described in a preceding paragraph. Hysteria is, however, applied to an overexcitability of the nervous system, a condition where emotionalism is apt to run riot, and all sorts of peculiar conditions obtained as a result of mistaken notions becoming fixed in the mind. Thus, hysterical paralysis is common. Hysterical aphonia, or loss of voice, is another rather frequent manifestation. Hysterical dyspepsia, hysterical hypersensitiveness, or its opposite, hysterical anesthesia, are also some of these disorders which make the life of the conscientious physician unhappy. Hysteria may lead to mob violence on the one hand, or to religious enthusiasm on the other.

Neurasthenia may frequently be cured by simple rest; but hysteria is only once in a while really cured. It is, however, only seldom that a neurasthenic has sense enough left to drop out of life and remain practically dormant for the many months necessary for a cure. These two classes of patients, therefore, form the support for the quacks and the wonder workers of every city. The hysterics do not realize, of course, in what their sickness consists, and will not, therefore, subject themselves to a prosaic course of treatment.

Re-education is the only successful method of treating

functional disorders. This consists in getting the patient away from his former environment into a room by himself; and then, patiently, day after day and week after week, explaining and demonstrating his real condition. Where this plan of treatment has been carried out, about one-half the patients have been practically cured and have been sent back into life as useful citizens.

We find in general that the nervous condition is best when the weight of the patient is nearest normal. Therefore, the feeding and exercising of hysterical and nervous patients must be carefully supervised, and the weight taken weekly.

The nursing in these functional disorders is most difficult, if the nurse be anything more than a caretaker for the body. The demand is made on her for constant sympathy, almost supernatural forbearance, and with it all a firmness and positiveness that will influence the patient for good.

CHAPTER XXXIV.

INSANITY.

Until just about a century ago insane persons were not treated as human beings, but as demons and criminals. They were kept confined by chains in dungeons, and fed on only a starvation diet and kept in as unclean a condition as is possible to imagine. This was largely due to ignorance of the nature of insanity; because to our forefathers it seemed a spiritual as opposed to a bodily condition and they apparently never considered how great is the influence of bodily conditions on the mind. The reform of 1795 began in Paris and then went to England, but the reform was simply in the treatment. The insane were considered by the reformers unfortunates rather than as evil-doers, and were treated more kindly, and their barren

lives made as easy as possible. But the application of laboratory methods to the study of insanity did not receive much headway until Kraepelin, of Heidelberg, in the last decade of the nineteenth century succeeded in developing a logical classification of mental states, based on symptom groups, and following the same principles as are applied to disorders of other parts of the body. For insanity has for its basis definite anatomic and physiologic lesions and is therefore a corporeal rather than a spiritual disorder.

The psychoses (as the different forms of insanity are styled) are as follows:

I. Insanity resulting from infection:
    (1) Delirium accompanying fevers.
    (2) Delirium from infection.
    (3) Polyneuritic insanity.
II. Insanity from exhaustion:
    (1) Delirium accompanying collapse.
    (2) Acute amentia.
    (3) Chronic exhaustion.
III. Intoxications:
    (1) Acute intoxications.
    (2) Chronic intoxications.
    (3) Alcoholism—
        (*a*) Chronic alcoholism.
        (*b*) Chronic alcoholic insanity.
        (*c*) Delirium tremens.
        (*d*) Acute alcoholism.
        (*e*) Alcoholic pseudo-paralysis.
        (*f*) Alcoholic melancholia.
        (*g*) Mania gravis potatorum.
    (4) Morphinism.
    (5) Cocainism.
IV. Thyrogenic insanity:
    (1) Myxedematous insanity.
    (2) Cretinism.

V. Dementia præcox:
  (1) Simple demented form.
  (2) Hebephrenic form.
  (3) Katatonic form.
  (4) Paranoid form.
VI. Dementia paralytica (paresis).
VII. Insanity accompanying definite brain disorders.
VIII. Insanity of involution (old age):
  (1) Melancholia.
  (2) Presenile delusions of weakness and misfortune.
  (3) Senility.
IX. Maniacal-depressive insanity (folie circulaire):
  (1) Mania.
  (2) Melancholia.
  (3) Delusions.
  (4) Mixed cases.
X. Paranoia.
XI. Constitutional neuroses:
  (1) Epileptic insanity.
  (2) Hysterical insanity.
  (3) Psychoses from fright.
XII. Psychopathic conditions:
  (1) Constitutional ill feeling.
  (2) Imperative ideas.
  (3) Impulsive insanity.
  (4) Unnatural sexual feelings.
XIII. Arrest of psychic development:
  (1) Idiocy.
  (2) Imbecility.

Groups I, II and III of the above classification are all due to the same general causes; namely, a poisoning of the cerebral centers. Thus, in the delirium of fevers the poisoning is due to the high temperature of the body—so that the delicate metabolic processes in the brain do not go on smoothly. The delirium of infection may be due

either to the presence of the toxins or to that of the germs themselves. Polyneuritic insanity is believed to be due to toxins rather than germ-bodies. The delirium of collapse has for its basis the poisoning of the higher cerebral centers by waste products; *i. e.*, the combustion-products of the katabolic processes are not washed out clean and new material is not brought in rapidly. Acute dementia may be due to a similar cause but differing from the last in the form of bodily (or mental) activity producing the result. We have already seen that the acute bodily intoxications are due to a similar poisoning with the difference that the poison was usually generated outside the body of the patient.

These disorders usually begin with mental excitement and generally end in coma or stupor; the same general effects are seen in the body also. Illusions are characteristic of the stage of excitement (exaltation), and are usually ocular. The patients mistake the objects seen. Accompanying this there are considerable mental confusion and loss of orientation. The memory* is affected and the patient invents tales to fill in the gaps of memory. As evidence of the disturbance of consciousness, we have the fact that after the attack the patient cannot remember what occurred during the attack. The prognosis of the acute cases is not always bad, because if the brain can be freed of the poison, the mind recovers to a large extent its former strength. The treatment must be aggressive; that is, the patient must be controlled absolutely. He must be fed well (with a tube through the nose if necessary). He must be sweated and purged to remove the

* In order to understand insanity, one must have a fair knowledge of psychologic processes, because the analysis of the symptoms presented by any patient must be made along the lines of the physiology of mental action. For instance, one patient shows an inability to perceive adequately and correctly. Another may be weak in his association of ideas, another in memory, etc. Hence, unless one knows the constitution of these psychologic processes, one is apt to remain unclear as to the underlying disorders resulting in insanity.

poison from the system, and he must be kept from exhausting himself. Institutional treatment is therefore best. A case of simple exhaustion-psychosis is the following from Bruce's "Studies in Clinical Psychiatry":

"Mrs. S., aged thirty-eight, was admitted into the asylum suffering from delusions of suspicion regarding her neighbors and certain unknown persons. Her illness, taking into account all the physical symptoms, had lasted four years.

"*History.*—No hereditary predisposition was admitted but the patient was undoubtedly a neurotic woman. She had a comfortable home, and had never suffered from any previous mental attacks.

"Four years ago, the patient's baby died. She had nursed the child for ten months and had become much run down and emaciated. Immediately after this she took influenza and was sharply ill. Upon recovering from the influenza she felt nervous and suspicious of those about her. Two years ago she began to imagine that her neighbors were speaking about her, and as she had a 'prickling' sensation in her skin she thought some one was 'playing electricity' upon her. She was at this time sleepless and dyspeptic. Her husband changed his house and for a time the change did good; but the patient never had a chance of resting, as she had three young children to look after and the housework to do besides. The old delusions of suspicion and electricity returned, and she was certified and sent to the asylum.

"On admission, she was a thin, weakly, ill-nourished woman, sallow and anemic and obviously depressed. She had an exhausted and confused appearance. She took her food, but complained of a weight and uneasiness after eating. Her bowels were confined.

"A blood examination gave the following results:—

"Hemoglobin, 45 per cent.; red cells, 3,500,000; leukocytes, 9000; polymorphonuclears, 47 per cent.; small lymphocytes, 23 per cent.; large lymphocytes, 28 per cent.; eosinophiles, 0; mast cells, 2 per cent. Her arterial tension was 140 mm. Hg, and her pulse was 80. She complained of an occasional 'prickling' sensation in her skin. The skin was, as a rule, dry, but every now and then she had drenching perspirations. She was menstruating upon admission. In her nervous system there was no abnormality except the subjective sensation of 'prickling,' and her voluntary movements were sluggish. Mentally she was depressed and confused. She stated that she had difficulty in understanding what was said to her. She further stated that she thought her neighbors laughed at and talked about her, and that she thought the 'prickling' sensation in her skin must be electricity. Some time prior to admission she had jumped out of a window, and she told me this was due to a voice she had heard telling her to do this thing, and for the time being she lost her head and tried to escape from this unseen terror. She took no interest in her personal appearance, and she told me that she only wished to rest, that she had no desire to work or talk or occupy herself in any way.

Her memory appeared good, but it was evident she had difficulty in recalling recent events.

"The morning following admission she had a temperature of 99° F., and she was very irritable and difficult to manage, refusing food and throwing herself about in bed. In the evening her temperature was 98.6°. The following day her temperature was normal and she was quiet and reasonable. She was kept in bed for two months, fed very carefully at first with milk and farinaceous foods, and later put upon ordinary full diet. She was given tonics of quinin, arsenic, nux vomica, and diluted acids, which were frequently changed. At the end of five months she had gained a stone in weight, and she was discharged recovered. At no period during her illness did she present any symptoms of toxemia."

In the **thyrogenic** insanities, aside from the body symptoms discussed elsewhere, we find a general sluggishness of all mental processes—from perception to willing. The treatment is, of course, the administration of thyroid extract.

In the asylums for the chronic insane nearly half of the inmates are suffering from **dementia præcox.** In the receiving institutions one-quarter of the inmates are suffering from this disorder. The perception, orientation, and consciousness of the patient are not affected. There are hallucinations and illusions of the sight, hearing, and feeling. The patient is easily led from one thought or purpose to another. He lacks an interest in his surroundings. His memory, however, is good. There is usually a flight of ideas.* There is a tendency toward stereotypy of word and action—a tendency toward repetition. The

* An example of the flight of ideas given by Dr. Rosanoff is the following: "Now, I want to be a nice, accommodating patient; anything from sewing on a button, mending a net, or scrubbing a floor, or making a bed! (Laughs, notices nurse.) But, I don't like women to wait on me when I am in bed; I am modest; this all goes because I want to get married again. Oh I am quite a talker; I work for a New York talking machine company. You are a physician, but I do not think you are much of a lawyer, are you? I demand that you send for a lawyer! I want him to take evidence. By God in Heaven, my Saviour, I will make somebody sweat! I worked by the sweat of my brow. (Notices money on table.) A quarter, twenty-five cents; In God we trust, United States of America, the Army and Navy forever!"

patient, however, is unable to come to decisions promptly or judge easily. He may or may not have delusions, but his emotional life becomes monotonous and dull. The power to will and to execute is weakened—it may be completely overcome by negativism; *e. g.*, when a patient is expected to extend his hand in greeting, he puts it behind his back; or, when he should stand, he sits still, etc. In general, he is unable to accomplish much at work. The usual symptom that calls attention to his condition is the change in his emotional nature. For example, he becomes morose and irritable and withdraws within himself instead of being bright and amiable as before. The intellectual faculties and the bodily symptoms vary with different individuals. Since, then, the disease attacks the association fibers, and the very centers of consecutive mental activity, it is an exceedingly serious disorder. The end is usually mental enfeeblement and death. Persons usually reach the asylum at about their thirtieth year, although the disease has usually existed long before that. In fact, the hebephrenic form is characterized by its beginning before the patient's twentieth year. The following cases from Bruce's "Clinical Psychiatry" illustrate this latter type:

CASE I. "J. D., male, aged twenty, was admitted in March, 1903, suffering from mild excitement and sleeplessness. There was distinct hereditary disposition, the father having been insane. He was a lad of good habits, steady and intelligent, but at the age of seventeen he had suffered from a mental attack which was treated at home. The present illness commenced three weeks ago with sleeplessness and change of habits and character. The patient left his work, wandered aimlessly about, often stayed for days at a time in bed, and was constantly sniggering and talking to himself.

"On admission, he was thin and poorly developed. There was no growth of hair on the face and he had a very boyish appearance. His expression was foolish and fatuous, and he sat up in bed chattering and laughing to himself. The temperature was 99.4° F., and for the next three weeks the temperature was frequently febrile, always in the morning. There were no gastric symptoms and the patient took food well. His leukocytosis was 12,000 per c.mm. with a polymorphonuclear percentage of 62. For the next three weeks the leukocytosis varied between 12,000 and 15,000, and the highest

percentage of polymorphonuclear cells recorded was 69. The heart's action was a little irregular, and the pulse-rate was generally faster in the morning than in the evening, and varied between 91 and 74 for the first week. No abnormality was detected in the respiratory, integumentary, or urinary systems.

"*Nervous System.*—There was no impairment of sensibility to touch, heat, or pain. The pupils were semidilated, but reacted to light and accommodation. The senses of sight, hearing, taste, and smell were all acute. The organic reflexes of micturition and defecation were under control. The skin and tendon reflexes were present and active, and there was no impairment of voluntary muscular movement. Mentally he was slightly elevated, but not in the least confused. He knew where he was and noted all that passed in the ward. There were no evidences of hallucinations or delusions, but his appearance suggested enfeeblement, and his constant giggling was abnormal.

"When first admitted he was restless, and several times got out of bed, but he was quiet and biddable when the nurse told him to go back to bed again. He had sufficient self-control to stop giggling and chattering during a medical visit, and he was never impulsive. His attention, however, was deficient, he could not settle down to read, and he could not carry on a conversation. His memory for recent and past events was good. The speech was clear and crisp, but boyish in tone, and he understood both written and spoken language.

"For the first three nights after admission, he slept only three hours, but after that, sleep gradually returned. He was kept in bed for six weeks and was fed on a full dietary supplemented with milk and eggs, but no butcher meat. At the end of three weeks he was much improved, and by the end of six weeks he had gained a stone in weight. During the next six weeks, when he was up and working in the garden, he developed enormously—his voice became deeper and more manly, his moustache and whiskers grew rapidly and his muscular development was good. He never took any interest in games, and was rather cowardly at cricket. He was discharged three months after admission, recovered. This case is of interest, as the case was seen early in the attack and demonstrates how physical improvement goes hand in hand with mental recovery."

Case II. "J. H., female, aged twenty-three, was admitted in April, 1902, because her friends were unable to manage her at home. She had been unable to follow her occupation as a domestic servant for a year prior to admission. Her mother was a nervous eccentric woman. The patient had been a bright, intelligent girl of good habits, and an excellent servant until a year ago, when she became peculiar in her manner, and eccentric and unreliable in the discharge of her work. At home, she was irritable, restless, and unable to work. She became abnormally shy and avoided the society of her relatives. She was often noticed going through automatic movements with her hands, and about three weeks ago she apparently developed hallucinations and delusions, as she thought that people were chasing her.

"On admission, she was a feeble, flabby, anemic girl below middle height, and very imperfectly developed for her age. She had a furtive shy manner, never looked one in the face, and generally sat with her chin tucked into her chest. She often sniggered in a silly, causeless way and refused to speak. The temperature was 98° F.

"Beyond suppression of menstruation, there was no physical abnormality detected. The leukocytosis was 13,700 per c.mm., and the polymorphonuclear percentage 53, but the large unicellular cells were 12.5.

"*Nervous System.*—She complained of no subjective sensations, and so far as could be detected, sensibility to touch, heat, and pain were acute. The pupils were dilated, but reacted readily to light and accommodation. The special senses were unaffected. There was diminution of the skin and tendon reflexes, and the voluntary movements were awkward. Mentally she was foolish and enfeebled, rather than depressed. She expressed no delusions and apparently did not suffer from hallucinations. She was quite unable to occupy herself in any way, either by sewing, knitting, or reading, and she took no interest in her surroundings. When she answered questions, she spoke in whispers, and it was impossible to test her powers of memory. On admission she slept seven or eight hours each night. Beyond the fact that she gained in weight there was no change in her condition until March, 1903, when she began to lose weight again. Attempts were made to occupy her in the laundry, but without success. During December, 1903, she complained of feeling sick, but her tongue was clean and she took food fairly well, but at times required to be hand-fed. Her pulse became fast—over 90 per minute—and she perspired freely. Then she became restless and sleepless, and suffered from hallucinations of hearing. During this exacerbation of symptoms, which lasted from December, 1903, to March, 1904, the temperature was irregularly febrile, the pulse fast, and the leukocytosis varied between 13,000 and 15,000 per c.mm., the polymorphonuclear percentage being between 50 and 60, but on two occasions the polymorphonuclear percentage rose once to 70 per cent. and once to 80 per cent. On recovering from this relapse, she again began to gain weight, and in May, 1904, she menstruated for the first time since admission. During this menstrual period, she first developed impulsiveness, when she made sudden and unprovoked attacks upon the staff and fellow-patients, stating as her reason for these assaults that people were calling her names. These impulsive attacks came on suddenly and without warning. For the remainder of 1904 she was always impulsive during menstrual periods, but the acuteness of the attacks gradually lessened, and she is now—May, 1905—much demented and only a little restless at the menstrual periods."

Dementia paralysis, or **paresis,** is probably what used to be referred to as "softening of the brain," etc., because it is accompanied by a general shrinking in volume and

change in the histologic character of the brain substance. It seems to be caused by syphilis and also by the complete exhaustion from the nervous overstrain of a weak constitution. It, therefore, occurs in middle life. It begins generally with disorders of memory, exaltation (or depression), and the flight of ideas. In contrast to dementia præcox the perception is weakened and inhibited, the attention is also weakened so that the patient cannot grasp the situation or know what is happening about him. Consciousness is also clouded—the patient is not clear as to himself, as to time, space, etc. He is easily fatigued. However, he has few illusions, or faults of the senses. The memory is rapidly destroyed. Speech becomes difficult and inaccurate—the patient cannot correctly pronounce difficult phrases. The pupils are apt to be unequal and irresponsive. The emotional nature gradually disappears, etc. Perhaps the most noticeable symptom of paresis is the delusion of grandeur, wherein the patient believes himself possessed of inexhaustible stores of wealth and power. In fact, quite often he believes himself to be God. In the beginning it is difficult to differentiate the disease from neurasthenia, but the later developments clear up the diagnosis. Thus, in the beginning we find a frugal good-natured man becoming careless, peevish, irritable, violent in temper, extravagant, foolish in investments, and more or less openly immoral. He is inattentive to his work, tires easily, and lacks concentration. He is garrulous, egotistic, and loud in voice and manner. Finally, however, the diagnosis becomes evident when delusions of grandeur and lapses of memory begin to occur, and he makes errors in calculating, and his handwriting becomes uncertain, and his speech difficult. The dementia gradually becomes more apparent, and the patient neglects personal cleanliness, and cannot care for himself. He may be carried off early by an apoplectic attack, or may remain for years a helpless dement. He does not recover. The following case, quoted from Bruce's

"Clinical Psychiatry," illustrates some phases of this disease:

"A. R., male, aged forty-eight, was sent to the asylum from the neighboring infirmary, to which he had been admitted as the result of a carriage accident. Prior to the accident his wife affirmed that she had seen nothing wrong with the patient, but in the infirmary he had been at times delirious and restless at night, and from the physical symptoms alone his case was diagnosed as one of general paralysis.

"The patient, who in his earlier years had acquired syphilis, had, so far as was known, always been a temperate steady man. On admission, he presented no physical symptoms beyond a slightly febrile temperature. His pupils were, however, unequal, irregular in outline, and failed to react to light. The muscles of the hands and forearms were very tremulous. The facial expression was 'flattened' and his facial muscles when he spoke twitched irregularly, and his tongue was very tremulous. His speech was slightly slurred, especially when he tried to talk rapidly. The tendon reflexes were markedly exaggerated, his gait was swaying, particularly when he turned, and he could not stand with the heels together when his eyes were shut. Mentally, he was enfeebled and emotional over trifles, but he expressed no delusions. He knew where he was, but was perfectly unconcerned, and his memory was rather hazy about both recent and past events. He lived for three years in this condition, becoming more and more paralyzed and demented, and finally died in a congestive seizure."

The **insanity accompanying brain disease,** such as tumors, abscesses, etc., depends for its characteristics and prognosis upon the seat of the primary lesion. Sometimes a tumor may be removed or an abscess drained and the patient recover to some extent his normal self. Usually, however, even after the successful treatment of the original disorder, the patient's mentality is not restored to its complete former power.

At the **menopause** in women there are apt to occur mental aberrations and disorders, accompanying the change in the nervous organism of the woman. They usually are melancholic* in type; *i. e.*, the disorders are those of

* In melancholia, the patient considers himself as wretched and worthless and accuses himself of imaginary crimes and faults. He sits, then, in hourly dread of punishment. Again, the patient may believe himself without friends, money, or clothing. This is quite

reaction and emotion. The perception and memory and reasoning powers seem untouched. The patients may believe themselves guilty of unknown crimes, or hold themselves responsible for unavoidable accidents, or believe themselves invalids for the rest of their lives. Quietness and cheerful environment usually bring about a recovery in a few months.

From sixty-five to seventy-five is apt to occur a beginning of the **senile dementia** in both sexes, accompanying the normal bodily involution. It begins ordinarily with melancholia, and gradually passes over into a permanent mental enfeeblement ("childishness"). The histologic changes accompanying these phenomena are atrophic in character and are found chiefly in the pons varolii. The treatment is, of course, simply the making of the patients comfortable.

The **manic-depressive** insanity is a remittent disorder of early middle life, beginning sometimes as early as the twenty-fifth year and lasting into the fifties. It attacks more frequently women. The attacks may be either maniacal or melancholic in type, or the one type may alternate with the other. The length of an attack is a matter of only a few months. The interval lasts about twelve to sixteen months, although under careful treatment the attacks may entirely disappear or recur only under special stress of mind or body. The prognosis, therefore, is not always bad. The treatment is institutional and is devoted especially to building up the body weight by hydrotherapeutic and dietary regulations. We quote the following cases from Bruce:

frequent in senile dementia. Or, again, the patient considers himself incurably diseased, the spinal marrow is softened, or the stomach is obstructed. Finally, nothing is what it appears to be. The sun is not shining, the bones are soft, etc. In general, the melancholic delirium is monotonous, repeating time after time the same thoughts. It is passive and humble. The delusions refer to the past or the future—rarely to the present. Melancholic delirium is apt to lead to the refusal of food and to suicide.

CASE I. "T. F., male, had his first attack of mental disease at the age of thirty-nine. There was a history of direct hereditary disposition to mental disease, and two brothers had also been treated in asylums.

"The first attack came on during 1898, and lasted for six months. The mental symptoms were at first those of pure depression, without hallucinations or confusion, but it is recorded that for the last two months of his residence he was talkative, forward, inquisitive, interfering in matters which did not concern him, and discussed his private affairs openly and foolishly with casual acquaintances. The first cycle of the disease consisted, then, of four months of depression and two months of excitement.

"The next attack commenced six months later with mild depression, which was quickly followed by excitement. The depression was not longer continued than a fortnight, but the excitement lasted for nearly three years. The onset of the excitement was quite typical. At first the patient became a little talkative and boastful of past performances. Then, be became insolent and domineering, had many quarrels with attendants and fellow-patients, and he wrote constantly to the authorities making complaints and charges against the management of the institution. His memory was excellent, and as he remembered all the little bits of scandal he had heard during his first residence in the asylum, he took a great delight in repeating these facts before the interested persons, and was quick to perceive a successful effort on his part. Then he lost his self-control completely, became noisy, abusive, and absolutely sleepless. When very excited and angry he was incoherent, but throughout the whole attack consciousness and knowledge of position were never lost. At one time he had apparently delusions of identity, as he believed that some of the attendants were 'McGregors'—a name for which he had a great aversion; but to the best of my knowledge he never suffered from hallucinations except once, when under the influence of bromid, he believed 'gases' were blown into his room at night. Throughout the attack he took food well, but he lost twenty-eight pounds in weight during the first three months of the illness. This loss was regained as the excitement gradually passed off. Treatment in this case was confined to the use of bromids and sulphonal, as the patient was too violent and hostile to allow of any attempts at lavage of the intestine, etc., being made.

"The second intermission lasted, like the first, for six months, when he was again admitted in a state of depression. He looked fat and well nourished, but the skin was pale and pigmented. His attitude was listless and his temperature 97° F. He took his food mechanically, but had no appetite, and his bowels were obstinately constipated. His leukocytosis was invariably high, but the increase was not in the polymorphonuclear cells but in the large lymphocytes and unicellular leukocytes. His heart's action was slow, the pulse full, and the arterial tension 140 mm. Hg. The skin was pale, pasty, and greasy; the urine 28 ounces. For the first twenty-four hours, sp. gr. 1022. There was a heavy deposit of urates, and 400 gr. of urea was excreted. He complained of no sensory disturbances, and his common sensibility was not impaired. The pupils were dilated

and sluggish in reaction to light and accommodation. Hearing, taste, and smell, were unaffected. The organic reflexes were under control, and the skin and tendon reflexes were active. Voluntary movement was sluggish, and to attempt the slightest manual work was a great labor to him.

"Mentally, he was depressed. There was little or no confusion. He did not suffer from hallucinations or delusions. He was quite self-controlled and his memory was good. He took no interest in anything, and apparently had no power of initiative. For the most part he lay in bed, only rousing up at meal times. His sleep was very irregular and deficient. During this attack he was treated by lavage of the intestine, large quantities of fluid by the mouth, and an occasional saline purgative. He slept better under this treatment, but I cannot say that the course of the disease was in any way altered by it, as the attack lasted for six months. The excited attack which was expected to follow the depression never came off, and the patient was finally discharged. The leukocytosis was high throughout the six months of depression, and he still presented this symptom upon discharge."

CASE II. "J. A. is an example of a short cycle. He has had recurrent attacks of excitement since adolescence, and there is hereditary disposition to insanity in his family. The attack commences with depression associated with 'rheumatic' pains, and very rarely lasts more than one day or at most two days. During the depressed stage, the leukocytosis may be as high as 17,000 to 18,000 per c.mm. of blood. As the excitement sets in, the leukocytosis falls, but rises and culminates with the excitement, to fall again to normal. The excited period lasts from three weeks to six weeks, and is characterized by a complete change in manner, habits, and appearance. He becomes forward and abnormally inquisitive, his habits—usually tidy—are now the reverse, and often filthy. His appearance is suggestive of a man in alcohol. His temperature usually rises in the evenings to 99° or 100° F. His tongue is furred and he suffers from thirst. The heart's action is fast, and the arterial tension is 130 to 140 mm. Hg. The skin is moist, greasy, and offensive; the urine scanty and high colored, and the sexual instincts somewhat accentuated. He has no sensory disturbances, and no impairment of sensibility. The pupils are dilated, but react readily to light and accommodation. Sight is very acute and the patient can read without glasses, whereas, between attacks, he uses glasses. There is no loss of control over the organic reflexes. The skin and tendon reflexes are active. Voluntary movement is rather excessive, and never incoördinate.

"*Mentally.*—He is elevated and not confused, and he never suffers from hallucinations or delusions. He is mischievous, sometimes destructive, always wanting in moral sense and attention to personal appearance. His memory is excellent and he can quote passages of Scripture on the slightest provocation, and all the events of past attacks seem to be vividly reproduced in each recurring one. The speech is inconsequent, but not coherent, and the tone of the voice is changed, being harsh and grating. In the intervals between at-

tacks, which sometimes last only a few weeks and at other times many months, there are no symptoms beyond an occasional hyperleukocytosis."

Paranoia is peculiar in that no part of the psychologic processes seems to be attacked except the association of ideas, and this only to the extent of permitting the development of a "fixed idea." This is really the exaggeration of a normal process, for the association of ideas itself is simply the referring and comparing of new percepts with old ones as standards. When, then, a wrong standard has once been set up, all new percepts are estimated in terms of this standard, and it is difficult for percepts that show the falsity of this standard to gain entrance to the mind and assist in forming concepts. Thus, because of previous fright or previous imaginings, some people cannot go near the edge of a bridge or the eaves of a house without being impelled to throw themselves over. The normal man resists the impulse, but the man with a weakened mind must yield. The idea of throwing oneself over is then called an "imperative idea." Similarly, by brooding over his misfortunes, a man may come to believe that he is being defrauded of his rights. Soon, some one in particular does him an ill turn and he immediately connects this person with all his misfortunes and believes himself the victim of persecution. When all subsequent events are judged in the light of this idea, of persecution, we speak of the idea as a "fixed" one. The patient usually goes on making more definite and enlarging his ideas of persecution until his whole life is dominated by the idea and he finds himself unable to live at peace with his neighbors and associates. Such people must, of course, be put into asylums. Sometimes under the influence of the rest and freedom from irritation they regain their balance and are able to enter society once more. However, the most of the paranoiacs do not reach the asylums but remain at large to temper the peace and happiness of their associates. It must be remembered that these people are logical in

their mental processes, and that the only difference between their mental operations and those of their neighbors lies in the sovereignty of the fixed idea and in the premises on which their reasonings are based.

Epileptics suffer a progressive mental deterioration as their disease advances. Either they are indifferent to all that occurs about them and then break out into spasms of causeless rage, or they are peevish and fault finding, jealous, egotistic and variable. Naturally, they become unable to live with their families and in community life. Their epileptic attacks are attended with amnesia, and during such times they may travel and do many things of which they have no knowledge when they awake. "Absence" is the term applied to the arrest of all psychic functions: "The patient suddenly becomes immovable, his gaze fixed, his expression vacant; the attack having passed, he resumes his work or occupation at the point where he left off." Sometimes, however, the patient may go through automatic movements during a prolonged absence. Thus, a barber may continue to ply his tools, even though his mind be a blank. Epileptiform attacks are not confined to epilepsy. On the other hand, epileptics have other seizures, which are not convulsions but which are equivalent to such convulsions. Thus, going on a drunken spree may be for an epileptic the equivalent of a convulsion.

Hysterical insanity seems to lie in the reaction—the ability to will and to do. The presence of imperative as well as fixed ideas is often demonstrable. The treatment is, of course, that of re-education as mentioned under Nervous Disorders.

Severe fright results in the upsetting of the normal routine and control of the mental processes, and patients find themselves unable to do some things and go some places that they should normally. The treatment is the same as in hysteria. The prognosis depends upon the original health and constitution of the patient.

The **psychopaths** are patients with some part of the personality either undeveloped or degenerated. Thus, there are those who have not the strength or resistance for the burdens of life, and who are forever disappointed, complaining,—mental invalids. Then, again, we find patients who are possessed by imperative ideas which drive them to theft, to arson, and even to murder. Some psychopaths dare not walk alone through an empty street (agoraphobia), but feel safe in a crowd. Others have convulsions if left in a closed room (claustrophobia). Others fear contamination, infection, and even dirt (mysophobia). The kleptomaniac must steal articles regardless of the need or use for them. Then we find the sexual degenerates. Some of these are excited by seeing or handling clothing or locks of hair of members of the opposite sex (fetichism). Others associate only with members of their own sex (homosexuality). Again, there are those who find pleasure in torturing children, or in being maltreated by members of the opposite sex, etc. Treatment is possible only in a closed institution.

The **idiot** is one whose intellect is that of a newly born infant; *i. e.*, there is a total arrest of development. The **imbecile** is one who has some mental development; but development inadequate to his age and station in life. Naturally, there are many classes of partial development, such as those who have some one faculty developed and the others remaining infantile. It is believed that one-half of all mental disorders are those belonging to this class of arrested development. The prognosis is usually bad, though much can be done by an early recognition of the condition and the institution of proper intellectual training.

The **treatment of insanity** is largely empirical, because as yet we have very slight knowledge of the processes leading up to the various disorders. In general, the treatment is symptomatic and aimed at giving the patient calmness and quiet. For mania, we find immersion in

warm baths more effective than mechanical restraint. These tubs are made so as to afford little or no opportunity for the patient to do himself damage in them. The water is kept at a temperature just above that of the body. The patient is immersed up to his neck and the surface of the bath covered with a sheet. He may remain in the bath twenty-four hours or more at a time.

In melancholia the first indication is the stimulation of the metabolic processes. Hence, such patients are given electrical treatments, hot baths with massage, and are fed on highly nutritious foods. If they refuse food, it is put into their stomachs by a tube through the nose. For this purpose, mixtures of raw eggs and milk are most effective.

The insomnia is one of the hardest symptoms to deal with. Heavy doses of hypnotics are sometimes used, but the best results are obtained when the fewest drugs are used. Here, the nurse's ingenuity in calming the patient by talking, reading, rubbing, etc., will be tried to the utmost. Music will also be found helpful.

In general, cures can be effected only in the early stages of insanity. Therefore, an effort should be made to put patients into proper hospitals before the diseases become fixed and hopeless.

CHAPTER XXXV.

DISEASES OF THE EAR.

Deafness is so common and the claims of quacks to cure it so blatant that every one having to do with the sick should get some understanding of aural troubles. In the first place, it should be clearly understood that there are three very different parts to the ear, so separate that a disease might easily be confined to each. Thus the

external ear, which includes the drumhead (membrana tympani), is very liable to external violence and injury, but it might be entirely removed and still the patient's hearing would hardly be impaired. It is only an accessory organ, and mechanical in its action. The middle ear consists of a bony cavity connected on the one side with the air cells in the mastoid process of the temporal bone, and on the other with the posterior nares by a tube about one and one half inches long. It contains the ossicles, which serve to transmit in a strengthened form the vibrations from the drumhead to the inner ear. Since the middle ear has such open connection with the posterior nares, it is very liable to infection from colds, catarrh, diphtheria, and other infectious diseases of the nose and throat. Then, too, the thinness of the bony wall between the brain and the mastoid cells makes it very easy for abscesses of the middle ear to develop into brain abscesses —with fatal consequences. Finally, the inner ear consists of two different capsules filled with fluid and incased in solid bone set deep within the skull. Floating in this fluid are the ends of the auditory nerve. Hence, very little damage from the outer world can reach the inner ear except by fracturing the skull. Infections do sometimes reach it, but it is only by way of the blood-current after the whole body has been exposed to the infection.

The troubles of the **external ears,** aside from those due to violence, are those due to faults in the secretion of the glands of the canal. Thus, the canal becomes obstructed with wax (cerumen) or little cysts form from the obstruction of glands along the sides. These disorders are best relieved by irrigating the canal freely with warm water, or solutions of hydrogen peroxid, which dissolve the cerumen nicely. When there is pain, the irrigating fluid should be as warm as can be borne with comfort. The use of oils or of opium for the purpose of relieving the ear pain is reprehensible; the warm water is much more effective and cleanly. A large proportion of the pains

referred to the ear are not due to ear troubles at all, but to interference with the many nerves which pass through the middle ear and about the temporal bone. Thus, inflammation in the lower jaw may be felt as pain in the ear; swellings of the parotid gland may have a similar result. So, also, an inflammation of the antrum of Highmore may cause such diffuse pain that it would be referred to the ear. Therefore, for many ear troubles, a dentist or a rhinologist may be the best doctor.

As might be inferred from the anatomy, the **middle ear** is most liable to disease. Such disease is usually the extension of some purulent disorder from the nose. The inflammation of the middle ear (*otitis media*) causes intense pain, with or without fever, and causes the ear drum to bulge outward until the pus eats a hole through it; and then the ear "runs." The inflammation, of course, attacks the ossicles also and renders them rough and rigid. Hence, after such an inflammation the patient is more or less hard of hearing. Finally, if the infection be specially virulent the pus eats its way into the mastoid cells and forms there a mastoid abscess,—with the threat of continuance into the meningeal cavity. A large number of middle ear disorders result from chronic nasal troubles, where the germs are not very virulent, and then we have only a subacute inflammation with but little pus, but a slow destruction of the ossicles and the lining membranes of the cavity. The condition rarely improves of itself; hence, whether the amount of pus is great or small, or whether there seems danger of mastoid abscess or not, middle ear inflammation or "catarrh" should be given treatment. If treated early, there is much chance of saving most of the hearing. This treatment consists in opening the membrana tympani and irrigating the cavity with antiseptic or sterile fluids both from the ear and from the nose. This requires some skill, and a nurse should not try to irrigate a middle ear until she has practised it a few times under the eye of the spe-

cialist. Such cleansing must be kept up for months and must be accompanied by the treatment of the catarrh and any other disorders of the body in order to do permanent good.

When a middle ear disease has produced deafness, it is better to remove all the ossicles and diseased tissue in the middle ear, because it has been found that the vibrations of the air itself are better heard than when dulled by being transmitted by stiffened bones.

In middle ear and mastoid abscesses the nurse should keep an ice-bag applied to the affected side until the surgeon can operate. Such patients need to be kept very quiet. The bowels should be kept open. The diet must, of course, be largely liquid, but it should be as nourishing as can be given. Considerable water should be drunk, and the skin needs frequent cleansing with stimulating rubs, *e. g.*, with alcohol. When, however, the ear pain is a reflex or referred one, the hot-water bottle is very comforting and usually sufficient.

Inner ear troubles are usually derived from brain tumors, or from the degeneration of or pressure upon the nerve. A peculiar dizziness or vertigo coupled with the hearing of a sound similar to the singing of a teakettle, is one of the inner ear diseases. It is known as *Menière's disease*, from the name of the man who first described it. The patient is apt to fall when attempting to walk alone. Heavy doses of quinin sometimes relieve the trouble for a time.

Seasickness is a disorder of the inner ear because it is usually due to the disturbance of the fluids in the semicircular canals, and since it consists essentially in presenting to the brain a new sensation, is overcome by accustoming the brain to that new sensation. Inner ear disorders, then, are beyond the use of any except constitutional treatment. Fortunately, they are rare.

CHAPTER XXXVI.

THE COMMON EYE LESIONS.

As far as we need to concern ourselves here eye lesions may be grouped into those of the conjunctiva, those of the iris, those of the cornea, those of the lens, and those of the nerve and retina.

The most common **conjunctival lesion** that demands the attention of a nurse is *gonorrheal ophthalmia*. This is so generally a disease of the new-born that it has also the name of ophthalmia neonatorum. It is due, as its name indicates, to the diplococcus of gonorrhea. The newborn babe acquires it while the head is passing through the vagina at birth. Older patients acquire it from wiping their faces with an infected towel or from the fingers. In order to protect the infant when there is a suspicion of the mother's having gonorrhea, the nurse should instil one or two drops of a two per cent. solution of nitrate of silver into the baby's eyes (into the conjunctival sac, not on the cornea) while she is washing him for the first time. In fact, in Germany the midwives are required to do this as a routine measure; and it has resulted in saving the eyesight of hundreds of children. The disease causes a copious discharge of pus from the eyes. The conjunctiva is red and swollen; there is photophobia (*i. e.*, light striking the eye causes pain); the lids can be opened only with difficulty. The inflammation gradually extends over to the cornea and perforates it unless checked. The perforation of the cornea allows the escape of the aqueous humor and the iris falls forward into the opening and an opaque mass results. The patient is then hopelessly blind. Naturally, the disease is very infectious; so that unless the most vigorous steps are taken to prevent it, the second eye is infected from the first. Hence,

if a patient is found with only one eye infected, the other eye should be immediately cleansed with antiseptic solutions, and sealed under a watch crystal in such a way as to prevent the access to it of germs. The sealing material is usually adhesive plaster around the rim of the glass. The treatment of the inflammation is the irrigation of the eye with an antiseptic solution every half hour or hour. The best solution is one of nitrate of silver. But, since the application of this is painful, the albuminates of silver are more often used. Thus, argyrol in twenty-five per cent. solution is injected with a medicine dropper into the conjunctival sac until all the pus is washed out. Protargol in ten per cent. solution may be used in the same way. The thoroughness of the irrigation rather than the kind of antiseptic used decides the success of the treatment. The nurse should wear rubber gloves when treating the patient, and should not mingle with the household until she has changed her gown and has had an antiseptic bath. It is, therefore, well for the nurse to have at her elbow a bowl of mercuric chlorid in 1 : 1000 solution, in which to dip her hands and the nonmetallic instruments when caring for patients suffering from gonorrheal ophthalmia. One to two weeks of excellent care will be needed in most cases before the inflammation subsides and convalescence sets in.

Ordinary *conjunctivitis* may be brought on by infection and also by the irritation of the eyes from dust and chemicals. *Pink eye* is the popular term for an infectious form of conjunctivitis. The treatment of the ordinary forms is simply the protection of the eye from irritation by applying a bandage and keeping the patient in good air, together with the thorough irrigation of the conjunctiva with a simple antiseptic solution. The usual solution is boric acid, four to five per cent. Sterile water is frequently just as good. The solution needs to be dropped freely into one canthus of the eye, and the eyeball rotated until every part of the conjunctival sac is cleansed. Such

Fig. 30.—Position of patient for dropping solutions into the eye.

inflammation may last a few days or a few weeks, depending on how old it was when treatment was begun and how good care is taken of the eye. *Trachoma* is an inflammation of the conjunctiva which attacks more especially the fornices, and is characterized by the formation of granules underneath the mucous membrane. It is regarded as almost incurable and somewhat, at least, contagious. Immigrants with trachoma are on that account not allowed to land in the United States. The treatment consists in using all the measures employed for an ordinary conjunctivitis and in addition thereto in crushing out the follicles.

A *corneal ulcer* is due usually to the spreading of a conjunctivitis over on the cornea. It betrays its presence by a grayish discoloration. The pain is intense. If it perforates, blindness is apt to result. Perforation is almost unavoidable if treatment is not instituted promptly. This consists in using a few drops of atropin in one per cent. solution to dilate the pupil and remove the irritation. Next the physician touches the ulcer with caustic to stop the spreading of the ulcer and kill the germs at work. Then a bandage is put on and the patient kept quiet. The bandage should be removed twice daily in order to irrigate the eye with an antiseptic solution.

Should a *splinter* or a *cinder* strike the cornea and imbed itself there, it can best be removed by dropping a little of a four per cent. solution of cocain into the conjunctival sac and then removing the object with a sterile but blunt spud. After the removal irrigate with boric acid and let the patient go. If a splinter of iron penetrate the eyeball, a powerful magnet is used to draw it out.

Inflammation of the iris is due generally to constitutional disorders such as syphilis. The local treatment consists in using atropin to dilate the pupil and hot fomentations to produce a local hyperemia. The eye must be protected from the light. Iritis is stubborn and the result of the treatment depends largely on the primary cause.

The chief disorder of the **lens** is the formation of *cataract.*

This means simply that the lens has become opaque. It must then be removed. This is done through an incision on the side of the eyeball. The operation, though requiring great skill, is short and almost painless. Asepsis is the one condition of success. Cataracts usually come on in old age, but injuries and diseases of the eye may bring them on earlier; and some are congenital.

The **optic nerve** sometimes becomes inflamed, or degenerates. Tumors of the brain, meningitis, hydrocephalus, obstruction to the artery, syphilis, and nephritis are the common causes. The result is, of course, blindness. Sometimes something, after the cause has been removed, may be accomplished by using hot fomentations or ice-bags, as the case may require, to reestablish the circulation in and through the nerve-fibers.

The most frequent eye trouble is **eye-strain,** due to a defect in the lens system as an optical instrument. Very few eyes are wholly perfect. Therefore, when a person must do much close work, such as studying or sewing, a correcting glass may be required—something that would not be needed if one were to do only coarse, outdoor work. The symptoms of eye-strain are frontal and occipital headaches, vertigo, gastric disorders (including vomiting), and general nervousness—even epileptiform seizures. The power of accommodation is greater in children than in adults. Hence many people do not discover that their eyes are defective until they reach the age of twenty-five or thirty. To examine the eyes of a person under forty, the oculist must temporarily put the power of accommodation out of commission; for this purpose, he uses atropin. With the eye at rest, he can study its defects and needs. For these reasons, it is not well to buy glasses of peddlers, or have them fitted by anyone who is not a graduate physician.

Color blindness is very common, but has for the ordinary individual no significance beyond its inconvenience. There is no cure for it.

CHAPTER XXXVII.

CANCERS AND OTHER TUMORS.

A tumor literally means a swelling. More especially does it refer to those swellings which have a distinct form and entity, such as neoplasms, aneurysms, displaced organs, and syphilitic gummata. Hence, when a surgeon in examining a patient feels a distinct mass away deep in the abdomen where no resistance should be felt, he calls such a mass a tumor, without implying anything as to its meaning. The laity, however, seems to believe that a tumor is necessarily a malignant neoplasm; and in conversing with them the term tumor should not be used unless clearly understood.

A neoplasm (literally, a new growth) is a mass of tissue endowed with the power of independent growth, attached as a parasite to some tissue of the body. Some neoplasms are always enclosed in capsules through which they never break to infiltrate the neighboring tissues. They, therefore, weaken the organism simply by the amount of nourishment they draw from it. In contrast to the other kind, they are called benign. These others do not keep within a capsule, but do infiltrate and destroy the surrounding tissues, and weaken the body not only by stealing its nourishment but also by destroying its organs, and poisoning it by their toxins. They are therefore called malignant.

Of the benign neoplasms the fibroids (really myomata) of the uterus, the lipomata (or fatty tumors) of the skin, the angiomata (*e. g.*, the naevi or birthmarks) of the blood-vessels, are common examples. Of the malignant neoplasms, the carcinoma, derived from epithelial cells; and the sarcoma, derived from connective tissue, are the best known. The last two are known by many people

as cancers, but properly speaking, a cancer is a carcinoma.

Whether or not malignant tumors are caused by germs or parasites has not yet been settled. The carcinomata can at least be transplanted from one person to another; from persons to apes; and from persons to mice. The other view of their origin is that they start from embryonic tissue left out of place and stimulated into growth by some accident or disease. At any rate, cancer cells possess the unpleasant power of unlimited reproduction, of living as parasites among the body-cells, and also of invading and destroying the surrounding tissues.

Cutting into such tumors or bruising them seems only to stimulate them to increased growth. Hence the danger of any except radical operations on malignant growths.

The growths are made up of endlessly proliferating cells with few if any blood-vessels. Therefore the tumors can never become very thick or far removed from the blood-vessels of the tissue acting as host. They therefore extend and spread, rather than grow thick and pendulous.

Carcinomata are found chiefly in the female breast, the uterus, the stomach, and on the skin of the face. Naturally, they vary much as to the rapidity of growth and their power of starting new growths by sending out cells through the blood and lymph-channels. Those of the face, called epitheliomata, are the slowest growing and the least malignant. The sarcomata grow in the bones, in the orbit of the eye, in the cavities adjoining the nose, from the ligaments, etc. Some of these are black in color and are then called melanomata. An endothelioma starts from the inner coat of the blood-vessels and is generally classified with the sarcomata. Both kinds of neoplasms are classified by the pathologists according to the type of cell presented with round or spindle shaped, or whether large or small. This is, however, a detail and need not interest us here. Another malignant growth is called

the synctioma malignum. This tumor grows on the site of the placenta in the uterus after abortions, etc.

Treatment.—The only effectual treatment for malignant tumors is complete extirpation. This can occur only when the tumor is young and small, because the tumor very soon infects all the neighboring glands, and metastasizes by way of the blood and lymph-channels to various parts of the body. Hence there is a great premium on early diagnosis. Because of the great issues at stake, patients with suspicious tumors should not hesitate to have pieces removed for examination under the microscope.

The *x*-ray cures small epitheliomata, but it cannot cure tumors beneath the surface of the body. In general, the best procedure is to remove the tumor thoroughly with the knife, and then expose the wound to the *x*-ray to prevent a return. No serum has as yet been found that is at all certain. Nuclein and trypsin have as yet only an empirical interest.

When a nurse is given charge of a patient with an inoperable cancer on the surface of the body, her duty is to keep the tumor from smelling by keeping it washed with hydrogen peroxid, and by keeping the surface somewhat hard by using formalin freely on it.

Fibroids of the uterus usually demand removal. If the whole uterus have degenerated into a series of fibroids, the whole organ must be removed. These growths occur most frequently in patients from thirty to fifty years of age. Similar action should be taken with other benign tumors, not only because of the cosmetic effect but also because they seem liable if let alone to degeneration into malignant tumors.

CHAPTER XXXVIII.

VENEREAL DISEASES.

It was not until in the decade of the eighties of the nineteenth century that morbus venerei was differentiated into its component disorders. Until then it seemed to be believed that venereal disorders were due to excess —to overindulgence—and the accompanying alcoholism. However, in 1884 Neisser found that a diplococcus was the causative agent in that form of venereal disease, characterized by a white purulent discharge from the urethra (and in the female from the vagina also). This he named the gonococcus. It lives within the cells as well as in colonies outside the cells of the infected tissue, and looks very much like two half coffee beans, or half biscuits cut apart, but lying side by side, as shown in Fig. 31. It was found that the gonococcus is capable of setting up an inflammation in the mucous membrane not only of the genital tract but also in the conjunctiva of the eye, and in the urethra and other urinary organs.

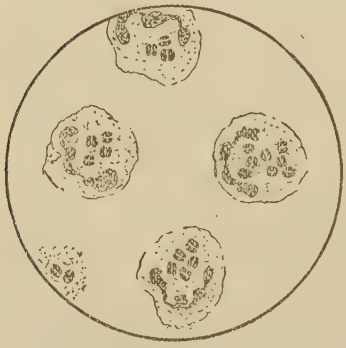

Fig. 31.—The gonococcus (Dr. W. K. Trimble).

In the nineties it was demonstrated that there were three forms of disease grouped under the term morbus venerei: the gonorrhea already mentioned, the soft chancre or chancroid, and the hard chancre or the primary lesion of syphilis. In 1905–1906 Schaudinn, of Hamburg,

found in all the syphilitic lesions a minute organism which looked like a snake or spiril. This he called the spirocheta pallida. This organism sets up the disorder known as syphilis whenever grafted into anthropoid apes, and therefore seems very probably the causative agent of that protean disease.

It remains, therefore, for the medical world to work out the pathology of the soft chancre, although it is generally believed that this is nothing more than the infection of a denuded surface with some of the common pus-forming organisms, though it may be due to a specific bacillus, called the bacillus of Ducrey.

While gonorrhea and syphilis may both be innocently acquired, the chief mode of transmission is by sexual intercourse. Hence, their propagation is due to the existence of prostitution and infidelity to the marriage vows. The diseases are as old as civilization, and quite as widespread. Because the diseases are in their very nature disgraceful, they are concealed and inadequately treated. Isolation and quarantine as established for other infectious diseases cannot be applied to them. Therefore, the best that medical men can do toward stamping out these diseases is to educate the growing generation as to their dangers and pathology, and trust to the growing moral sense of humanity to avoid the occasion for acquiring them.

Gonorrhea is essentially a local disease and sets up a thick purulent discharge wherever inoculated. It does not form an antitoxin and therefore may be inoculated from one part of the body upon another; as, for instance, when the pus from the urethra is touched to the eye it sets up at once a violent ophthalmia. Neither does the having of the disease confer immunity; the disease may be had as often as the person becomes the recipient of infection.

The incubation period varies from one to four days.

The first symptoms of urethral gonorrhea are the pain

and burning on urination and the discharge. There may be developed a frequency of urination which keeps the patient in almost constant pain, or it may be almost impossible for the patient to pass urine. This condition, if untreated, continues for a week or two and then the discharge gradually grows thinner, and the irritation changes its character. In perhaps half the cases, the irritation remains in the anterior urethra and becomes chronic,—starting up afresh whenever there is a local irritation or a constitutional weakness developed. Thus, the drinking of alcoholic liquors, fatigue from overexertion, and venereal excess all tend to kindle afresh the latent inflammation.

When, instead of settling down and becoming chronic in the anterior urethra, the inflammation progresses upward in the male urethra, it may set up a cystitis, or it may pass by way of the vasa deferentia to the testes and there set up an orchitis. The cystitis may develop into an inflammation of the ureters and thence of the kidneys; while the inflammation of the vasa occludes them and renders the passage of the spermatozoa difficult. The former leads, of course, to a general infection and death; the latter to sterility.

In the female the urethritis may develop into cystitis as with the male, but the usual infection is that of the vagina. In the vagina the glands of Bartholin receive the chief infection and retain it indefinitely. From the vagina, the cervical canal and the endometrium become infected (endometritis), thence, the tubes (salpingitis), and the peritoneal membranes surrounding the uterus and its adnexa (pelvic peritonitis, the so-called perimetritis, etc.). The effects of a cystitis are the same as in the male. The effect of the endometritis and the salpingitis are dysmenorrhea and barrenness. The latter effect is so frequent that it is believed that forty per cent. of the barren marriages are due to gonorrhea.

If not rendered barren at once by the receipt of the gonorrheal infection, a woman is apt to become so imme-

diately after the birth of her first child, because the disturbance of the tissues due to the birth reinflames the now very susceptible tissues and the tubes become occluded. Hence, a great majority of the one child marriages are due to gonorrhea.

When the gonococci become absorbed into the circulation, they are apt to set up an arthritis, usually monarticular, and accompanied by fever and other constitutional disturbances. This gonorrheal rheumatism is particularly liable to set up a fatal ulcerative endocarditis, and thus end the tragedy.

Gonorrhea is then a disease not to be lightly esteemed. Moreover, it is a disease very difficult of cure. The curing of it requires a long continuance of a very vigorous treatment,—just what, as we have seen, it does not ordinarily receive. The treatment is essentially local and consists of irrigations with antiseptic solutions and the application of soothing medicines. Even when medicines are given by the mouth, they are given for the sake of their local effect on the urinary passages while being excreted by the kidneys.

Nurses who treat gonorrheal patients should wear rubber gloves when giving the irrigations and baths, and other local treatments. They should also be careful to change at least their aprons before going to their dormitory, or mingling with other people. They will do well to keep a basin of lysol or mercuric chlorid solution in the room and moisten their hands in it frequently. Wash cloths, towels, and treatment utensils should not be used with other patients until they have been thoroughly sterilized.

In all gonorrheal troubles rest in bed is the first essential of successful treatment. Pelvic peritonitis, dysuria, and other painful affections are best treated by the local application of heat. Thus the hot pack reinforced by an incandescent lamp renders the patients quite comfortable. The usual germicide is some silver solution. Of

these the nitrate in a one to two per cent. solution is the most effective; but since it is painful the albuminates are usually substituted. Whatever is used, the nurse should remember that it is the thoroughness of the irrigation—the completeness and frequency of the washing of the tissues—that helps rather than the chemical effect of the germicide.

Syphilis differs from gonorrhea greatly. In the first place, its effect is constitutional rather than local; second, it confers immunity; and, finally, it may be transmitted to the offspring.

Its incubation period is from ten to forty-five days.

The first symptom is the appearance at the point of infection of a hard, raised papule. It differs from ordinary eruptions in that its base feels like parchment. This papule may become an ulcer with undermined edges, or may simply dry up and disappear. This is all of the local effect or primary effect. It becomes troublesome only when infected with other germs than that of syphilis, in which case one may find a painful ulcer with an indolent—or painless—swelling of the neighboring lymphatic glands (buboes). But all these manifestations disappear without any special treatment other than cleanliness and the possible application of antiseptic solutions or powders.

The secondary stage is reached about six weeks after the infection and cannot be avoided even by treatment of the primary stage. The first symptoms are those accompanying ordinary constitutional infections: malaise, insomnia, depression, irritability, glandular swellings, nocturnal headache, etc. As these gradually disappear, exanthemata develop. These consist of roseolæ of brownish color and without itching, large macular syphilides (raised and livid, or copper colored), papular syphilides (varying from a pin-head size to two cm. in diameter), pustules (looking like smallpox at first and leaving light colored scars with pigmented edges), eruptions on the palms of the hands and soles of the feet, ulcers and fissures

about the anus and genitals, falling of the hair in spots, and ulcers of the mouth. This, then, is the period showing the constitutional infection. It is the one when the patient generally comes for treatment. All these lesions show almost immediate response to the use of mercury (by inunction, by ingestion by the mouth, or by deep intramuscular injection). Hence the disease may usually be stopped at this stage, but in some people with weak constitutions, it may in spite of the most vigorous treatment go on to the third stage.

This third stage may appear at any time after six months from the original infection. It is characterized by the formation of *gummata** and multiform disorders of the bones, blood-vessels and internal organs. The lymph-glands of some parts of the body at least are usually enlarged. Nervous disorders such as tabes dorsalis (locomotor ataxia), paretic dementia and apoplexies, are liable to appear; and in general the stage may be thought of as one in which degenerations of any and all tissues may appear. The effect of syphilis of this stage is often seen in the breaking down of the bridge of the nose and the development of a saddle nose. Again, gummata of the brain may appear, causing fearful headaches, convulsions, etc. In general this stage exaggerates and renders dangerous any and every disorder of the body that may be present.

The woman infected with syphilis usually is unable to carry a child to term until after three or four miscarriages. And even then the child is affected with the hereditary form of the disease. The man also may transmit the disease to his child, even without directly infecting the child's mother.

The most contagious elements of syphilis are the eruptions of the secondary stage, especially the papillomata

* A gumma may simulate a cancer (epithelioma) and other tumor forms, and in general may be defined as a neoplastic tumor composed of small round cells and liable to appear in any tissue.

and the condylomata of the mucous membranes. Therefore the kiss of a syphilitic may be as dangerous as a call on a smallpox patient. For this reason drinking-cups and similar utensils used by the public are dangerous to those not immune to syphilis.

Treatment.—Fortunately syphilis yields to medicinal treatment, and if patients would only take adequate treatment would soon be restricted in its extent. The term of treatment is at least three and one-half years. That is, a syphilitic should during this period take frequent courses of treatment, their length and frequency being varied by the physician as the occasion may demand. The lesions of the primary and secondary stages yield to mercury. Those of the third stage and the hereditary form to the iodids.

When a nurse is directed to use a mercurial inunction, she should use a 50 per cent. blue ointment, and rub in a piece the size of a pea every day. She should apportion the body of her patient into six parts and use the ointment on a new part each day for the six days. Then the patient should have a hot cleansing bath and the inunctions begin all over again. For these reasons the patient should be clothed in old underwear, such that he can burn it up at the end of each six-day period. The usual apportionment of the body is the following: first day, left arm; second day, left leg; third day, right arm; fourth day, right leg; fifth day, back; sixth day, chest and abdomen. The nurse should, of course, wear gloves when rubbing the patient—gloves that do not absorb the mercury. She should be very watchful of the cleanliness of the patient's mouth, lest he become insalivated. Hydrogen peroxid should be used to cleanse the mouth three times a day.

Primary lesions, the condylomata and the ulcers are kept dry by dusting frequently with powdered calomel. The secretions of all these lesions are exceedingly contagious. The nurse should, therefore, disinfect herself thoroughly

and be sure not to carry any utensil from a syphilitic to another patient.

Patients with syphilis should not marry until after four years of careful treatment. Those with gonorrhea not until gonococci cannot be found in the secretions of the genito-urinary tract.

The *soft chancre* disappears after a short term of simple antiseptic treatment, and apparently leaves no after effect, either constitutional or local.

CHAPTER XXXIX.

INTESTINAL PARASITES.

From earliest infancy micro-organisms of various sorts inhabit the human intestines and have much to do with the fate of food in the digestive tract. Some of these appear to have no effect on the general health, while others liberate toxins of the deadliest sort. Of the former the most common is the bacillus coli communis; of the latter, the bacillus typhosus; while the animal parasites occupy an intermediate position. The latter, such as the worms, offer insult to the organism because they obtain their nourishment by sucking blood from the intestinal walls, and thus set up hemorrhages sufficient (because of their number) to cause grave anemia.

The *pin worm* or *seat worm* (oxyuris vermicularis) measures 4 mm. for the male and 10 mm. for the female. It inhabits the lower bowel. It causes intense itching about the anus and genitals. Besides this, there are reflex nervous symptoms, such as grinding the teeth and general irritability. The diagnosis is easy because the worms are easily detected by their white color and movement in the stools. The treatment is by active purges

accompanied by intestinal antiseptics, followed by antiseptic enemata. They are transferred from person to person by infected food and drink; generally, of course, by means of their eggs.

The *round stomach worm* (ascaris lumbricoides) inhabits the upper bowel, and is even vomited up through the stomach. The male measures 15 to 17 cm., and the female 20 to 25 cm. They look like earth worms. Bad digestion, nose itching, poor appetite, grinding of the teeth in sleep, and even colic, are the symptoms of the presence of this parasite. Even convulsions occur. The diagnosis is made by finding the worm in the stools. It is brought away by calomel and santonin in divided doses. It requires no intermediate host and therefore passes from person to person in food and drink infected with the eggs.

There are three forms of *tape-worm* (cestodes) to be reckoned with. The most common is the *tænia saginata*, or *mediocanellata*, which finds the intermediate host in the beef. This worm produces segments measuring from 17 to 18 mm. by 8 to 10 mm., and may reach a length of 25 to 30 feet. The *tænia solium* is developed by the hog. Its length reaches about 12 feet and its segments are smaller (10 mm. by 7 to 8 mm.). The embryonic worm can pass into the tissues and there produce cysts. The *bothriocephalus latus* is found in fish. It reaches a length of 25 feet. It is rare in America.

The symptoms produced by tapeworms are craving hunger (accompanied, however, by a sense of fullness), nervous reflexes, etc. There is usually some anemia caused by the loss of blood, which, of course, produces symptoms of its own. The diagnosis is made by finding the eggs and segments in the stools. To find the segments, the easiest way is to pour the suspected stool into a sieve, and then run water through until all the soluble matter passes through. The segments look like macaroni. The treatment includes dieting the patient and then giving extract of male fern or similar tæniafuge with cathartics.

The *tænia echinococcus* is found also in dogs. The adult worm measures 2½ to 6 mm. in length, and is made up of three or four segments. In man the eggs are hatched in the intestinal canal and the embryos pass through the walls into the various organs, chiefly, however, to the liver. Here they become encysted and develop more cysts by budding, thus gradually developing a large tumor. There is in the cyst besides the embryo also much fluid. These cysts may endure for years or burst or perforate the capsule of the organ in which they lie buried. Therefore, fluctuating cysts in and about the liver are suggestive of the echinococcus when found in persons who have had much to do with dogs. The symptoms are those due to a tumor in the organ infected. The treatment for perforation, etc., is, of course, surgical.

The *uncinaria*, or hook-worm, is abundant in the subtropical countries. It measures 7 to 11 mm. in the male and 10 to 18 mm. in the female. This worm does not require an intermediate host, but is found in the soft warm mud, and penetrates the skin of the feet or hands exposed to this mud. Once under the skin it migrates rapidly to the intestine, where it lives on the blood of its host. Its symptoms are, therefore, those of an intense anemia (pernicious anemia) with muddy skin, dull eyes, and general weakness. The eggs pass out with the feces and hatch in the mud and are then ready to infect another host. The diagnosis is made by finding these eggs in the stool by microscopic examination. The treatment consists in giving heavy doses of thymol, and then by treating the anemia.

The hog gives us not only the tænia solium, but also the *trichina*, which measure 3 to 4 mm. in the female and 1 to 2 mm. in the male. The worm lies coiled up in the muscles of the hog. When this is eaten and the capsule digested by the fluids of the human intestine, the worm is set free and in about a week develops a brood of embryos which are discharged into the lymph-spaces. Thence,

they pass into the muscles, and become encysted. If there are only a few, there seems to be small danger to life and the cysts may remain intact but viable for as long as twenty-five years. If, however, there are multitudes of the embryos, there is fever (102° to 104° F.) of the irregular type, pain in the muscles, edema, etc. The duration of a light attack is ten to fourteen days; in the worst cases death occurs in from the second to the sixth week. The only effective treatment is that instituted immediately after eating the pork. At that time purges and intestinal antiseptics and vermifuges will be found effective. If nothing is done until the fever breaks out, all we can do is to support the patient's strength until the cysts become complete and quiet. Thorough cooking destroys the trichinæ. Hence, uncooked pork should never be eaten.

The amœba coli causes a dysentery. It is found chiefly in tropical countries, but is not unknown in America. The treatment is chiefly the irrigation of the colon with strong quinin solutions.

CHAPTER XL.

TROPICAL DISEASES.

Now that the United States is in such close contact with the tropics not only commercially but also politically, intercourse with the natives of the tropics is increasingly common, and our people are also visiting these regions in greater numbers every year. This has brought about the introduction of many tropical diseases into the United States, and also exposed our countrymen to many new forms of disease on their visits to the colonies. We believe it worth while, therefore, to give a brief account here of a few of the more important tropical diseases,—

yellow fever, bubonic plague, cholera, dengue, Malta fever, beri-beri, dysentery, and trypanosomiasis.

Yellow Fever.—This disease has made communication with the cities and countries south of us dreaded and dangerous. It is an epidemic disease in the United States, the last epidemic being in New Orleans in 1905. The disease has been endemic in Central America and the West Indies, but American sanitation has succeeded in rendering it sporadic wherever the United States government has secured control. Its range may be said to lie between 45 degrees north and 35 degrees south latitude (Guiteras).

The disease begins after an incubation period of three or four days, with headache and general pains, and a rapidly rising fever. The tongue becomes coated and the throat sore, the bowels constipated; and gastric symptoms (vomiting and retching) become very troublesome on the second or third day. The eyes and face are flushed at the very beginning and show a gradually deepening jaundice, which gives the disease its name. The fever continues for three or four days, and is followed by a period of remission ("calm") lasting one or two days. This in turn is followed by a secondary fever which may end after another period of two or three days by a short lysis. The pulse is peculiar in that it may begin with a rate of 100 to 110, and with an increasing temperature gradually lower the rate so that at the end of the fever the rate may be only 50, or even as low as 30. From the third day on albumin is found in the urine. The nephritis thereby indicated may be so severe that anuria with uremic coma may supervene, producing, of course, death. While delirium is frequent, still the mind of the patient is generally unusually clear and alert. The vomited matter soon becomes bloody, and because of its color has given the disease the name "black vomit."

The mortality ranges from 15 per cent. to 85 per cent. It is lower among negroes than among whites. It is greater among alcoholics than teetotallers. The surround-

ings and strength of the patients have much to do with the outcome. Immunity is not always gained by one attack.

The disease is transmitted by the stegomyia fasciata mosquito. It takes a period of twelve days for the causal organism to develop within the body of the mosquito sufficient to make the insect's bite infectious. Hence, two weeks usually elapse between the breaking out of the first and the second case, or between the time when the mosquito bites a patient and when the same mosquito infects another victim.

Treatment.—The first thing to be done, therefore, in the treatment of a patient ill with yellow fever is to isolate him and screen him so thoroughly that no mosquito can bite him. The fever is treated with cold baths —as typhoid. The constipation is relieved at the outset with a good purge. The gastric hemorrhage is treated with the solution of perchlorid of iron or similar astringent. Digitalis and similar drugs are used to keep the heart and kidneys active. The value of quinin is disputed. The vomiting is probably best relieved by ice given in small pieces. Food can be given by the mouth only when there is no vomiting. In general, nutrient enemata are demanded throughout the disorder.

Bubonic Plague.—This disease is probably what was called the "black death" in the fourteenth century, and which destroyed one-fourth of the population of Europe. It was also made famous by the great plague of London described by Defoe in 1665, when 70,000 out of a population of not over 500,000 died. Of late years the disease has found a focus in China and India, and thence has found its way repeatedly into Great Britain (Glasgow, 1900), America (San Francisco, 1904, 1907), and into Mediterranean Europe.

The disease is caused by a bacillus (Bacillus pestis) which resembles that of the chicken cholera. This bacillus invades the blood as well as all the organs of its victim,

and hence the disease is a veritable septicemia. It is communicated by flies, fleas, mice, rats, dogs, etc., as well as somewhat by the air. Hence, it is both contagious and infectious. Attendants of the sick are, therefore, in great danger of taking the disease.

Its mortality varies from 70 to 90 per cent.—making it the most deadly of acute infectious diseases.

The disease appears in two forms or degrees: the *pestis minor*, the ambulant form, in which there is a swelling of the glands (buboes) and a few days of fever; and the *pestis major*, or usual form. This begins, like most septicemias, with headache, backache, malaise, and mental depression. The fever rises steadily for three or four days to from 104° to 106° F., then drops a degree or two, after which a secondary rise appears. The tongue is brown. The glands, especially those of the groin, swell. If they suppurate, it is regarded as a favorable symptom, but they usually become gangrenous instead. The "plague spots" are petechiæ scattered irregularly over the skin. Death occurs in the first three or four days, except in the fulminating form (*pestis siderans*), where it occurs in twenty-four hours. Sometimes the disease appears as a pneumonia, and this is even more fatal than the septicemic form.

Treatment.—The first consideration in the treatment of persons ill with the plague is to prevent the spread of the disease. This should be thought of the more because the first cases in an epidemic are usually of the pestis minor form and therefore liable to escape notice and diagnosis. Such ambulant cases are the very ones to scatter the virus. Hence, early diagnosis and prompt isolation are needed in all suspected cases. The clothing, the urine, the feces, the sputum—in fact, everything in contact with the patient is infectious and requires immediate and rigorous sterilization. The bodies of the dead should be cremated. The convalescents should be kept isolated for a month after the subsidence of the fever. Inasmuch

as vermin and rats are the chief means of spreading the disease, a campaign for their extermination should be undertaken. For the extermination of the rats, a bacillus (that of Danysz) has been found useful. Fumigation of the buildings exposed to contamination with sulfur as well as with formaldehyd (the latter should be kept up for twenty-four hours) is necessary.

The best treatment is by vaccination; *i. e.*, either the prophylactic inoculation when in danger of being exposed, by the use of an attenuated virus (Haffkine); or for those actually exposed the serum of Yersin and Roux.

The patient should be kept as comfortable as possible with ice-bags and cold baths. The buboes may be treated with injections of mercury and the patient stimulated with strychnin, etc. The nurse, however, can do little more than keep the patient supplied with cooling drinks and rubbed with cool antiseptic solutions. Her chief duty must be, while caring for the patient, to prevent the spread of the disease; and it will be only by heroic efforts that she keeps herself free from infection by the use of corrosive sublimate, carbolic acid, and alcohol solutions.

Asiatic Cholera.—*Cholera asiatica* is to be distinguished from *cholera nostras* or *cholera morbus*, and, again, from *cholera infantum.*

Asiatic cholera is caused by a bacillus called, because of its peculiar shape, the comma bacillus. The disease is endemic in India whence it is transported to the occident along the caravan routes by pilgrims and the ordinary intercourse of commerce. It was epidemic in the United States nine times during the nineteenth century.

The disease is not very contagious. Apparently, infection takes place through the digestive tract. Hence, epidemics usually spread by means of the water supply. The doctors and nurses attending cholera cases are not often infected, but the washer-women and those handling the linen from such patients frequently suffer.

After an incubation period of three to five days, a diarrhea sets in with colicky pains in the abdomen. There are headache and nervous depression, but only rarely fever. As this diarrhea increases in severity the stage of collapse is introduced. The temperature may be subnormal in the mouth or under the arm, but still show 103° or 104° F. on a thermometer inserted into the rectum. The loss of water causes the skin, especially that of the face, to become ashen, the eyes sunken, and the cheeks hollow. The stools now have the appearance of rice water, due to the presence of flakes of mucus, serous matters, and even blood. The patient can still secrete perspiration, but the urine and saliva are checked by the lack of fluidity in the blood. Patients may, however, die before this purging begins. The preliminary diarrhea lasts for one or two days, the collapse stage from two to twenty-four hours; and then if all goes well the reaction leading to convalescence sets in.

Convalescence may be rendered difficult by the occurrence of local complications such as diphtheritic colitis, parotitis. Even pneumonia and pleurisy may appear.

The mortality varies from 30 to 80 per cent. The previous condition of the patient's health and environment largely determine the result.

The *treatment* must be prompt if it is to be effective. No medicine need be given by the mouth. During the preliminary diarrhea, full doses of morphin may be introduced hypodermically. The nurse should irrigate the bowel (using the long colon tube and forcing the fluid past the ileocecal valve, if possible) with three to four liters of a normal salt solution or two liters of a two per cent. tannic acid solution at 110° F. This may be repeated as often as the patient's strength permits. Normal salt solution should in the collapse stage be introduced subcutaneously. For this, the solution should be at 107° F., and should be introduced slowly in the subcutaneous tissue, preferably of the chest, and should be kept up as

long as it is absorbed. Of course, such a solution must be sterile and given under aseptic conditions.

Dengue (*Den'-ga*).—This disease is also known as breakbone fever, or dandy fever. It is characterized by agonizing pains, high fever, and an eruption sometimes macular, sometimes diffuse.

After an incubation period of from three to five days the fever begins with headache, pains in back and joints, and a rapid pulse. The temperature may reach (in a gradual ascent) 106° to 107° F. The skin becomes congested and erythematous with a varied eruption. The mucous membranes are also congested and may bleed. After three or four days of fever, the temperature falls and remains normal for from two to five days, when the second paroxysm occurs, similar to the first but usually shorter. This may end the attack or a second remission and third fever stage may appear. During the disease there is more or less swelling of the lymph-glands and of the joints.

Very few deaths are caused by the disease. Its causative organism is unknown. It must be distinguished from acute rheumatism and yellow fever.

The *treatment* is chiefly that of quieting the pains. Therefore, cool sponging, the ice-bag, and the use of morphin hypodermically will be called for. During convalescence careful attention to the joints and glands will be required, and massage and tonics utilized.

Malta Fever.—This disease is found chiefly along the shores of the Mediterranean, but also in Porto Rico and Manila.

The period of incubation varies from six to ten days. The fever is of the intermittent or undulating type—rising and falling without much regularity or rhythm during a period varying from one week to six months. There are neuralgic pains, swellings of the joints, constipation, and a progressive anemia accompanying the disease.

The disease, therefore, is apt to be confused with tuber-

culosis, pyemia, typhoid fever, and similar disorders. The blood-tests (agglutination of the causative organism with dilute serum from the patient's blood) and the finding of the organism, the *micrococcus militensis*, must be relied upon for the diagnosis.

The treatment as far as the nurse is concerned is that of typhoid fever.

Beri-beri.—This is a multiple neuritis in which the legs become weak and less sensitive. The trouble may reach the arms, head, and trunk. The affected area is edematous. The power of sensation is not only lessened but also changed, so that pains, itchings, crawlings, etc., are felt. The heart and vital organs are affected so that there is heart palpitation and shortness of breath. The latter type may predominate and prove fatal within twenty-four hours. Usually, however, the disease extends over weeks and months, and is especially prevalent in warm weather.

Beri-beri, or kakke, is found endemic in China, the Malay Archipelago, Japan, and the Philippines. It is present also in South America and the West Indies. The fishermen on the Newfoundland Banks are often attacked, as are also the Chinese and Japanese in California. This disease has also appeared in Louisiana and Arkansas (in state hospitals where the patients were too crowded to be well fed and cared for).

The mortality varies from 2 to 50 per cent.

The disease may be due to an infective organism, or to the toxemia of improper food. For instance, it has decreased in the Japanese navy since the use of fresh fish was forbidden (perhaps because the Japanese frequently ate such fish raw).

The *treatment* calls for the salicylates, massage, and electricity. The patients need to be fed well on well-cooked nitrogenous foods and kept warm and quiet. The skin demands two baths or rubs daily. The ventilation of the sick-room requires special attention.

Trypanosomiasis and Sleeping Sickness.—This is a tropical disease due to an animal parasite—a protozoön found in the blood of its victims.

The symptoms of trypanosomiasis in general—such as is found in the Philippines—are an irregular fever, emaciation, loss of strength, swelling of the lymph-glands and the spleen, and edema of the feet. Trypanosomiasis occurs in Africa in the form also of the sleeping sickness since this disease has been found to be caused by a trypanosome. This disease presents a latent period of five years or more and is characterized by apathy, mumbling, tremor, and difficult locomotion, gradually deepening into drowsiness and sleep. The patient finally dies of some secondary infection such as septic meningitis. The duration varies from three months to a year after the beginning of the active symptoms.

Sleeping sickness is uniformly fatal, but patients sometimes recover from the other forms of trypanosomiasis.

The carrier of the infection seems to be the tsetse and similar flies.

It is possible that the new remedy suggested by Ehrlich—trypanroth—may be of help in the disease. But at present all one can do is to make the patient comfortable.

CHAPTER XLI.

SURGICAL NURSING.

The key-word to modern surgery is cleanliness. In fact, all the elements which have brought about the revolution in surgery are due to the discovery that cleanliness was the *sine qua non* for operative surgery. However, the surgeon must depend for his cleanliness upon his nurses; therefore the nursing in a surgical case can usually determine its success. Hence it is absolutely essential that any one who wants to do surgical nursing must know the importance and technic of surgical asepsis.

Up to 1870 surgery was a refuge which no one sought except under the direst necessity. This was due to the fact that almost every wound discharged pus and was of doubtful healing. If an operative wound healed up at once without any suppuration, it was done without anyone's knowing the real cause for its doing so. For this reason it was practically impossible to do any intra-abdominal operations or any operations on tissues which were extremely delicate and susceptible to infection. Joseph Lister, of England, had among others pondered over the cause of suppuration, and about 1867 came to the conclusion that the cause of suppuration was not inherent to the wound or the tissues, but was something that got into the wound from the outside air while the wound was open or the parts separated, as during an operation. He therefore provided a spray of carbolic acid solution which fell in a shower over the whole operating field. The success of his experiment was phenomenal. Patients recovered under this line of treatment who were considered hopeless for operation under the old *régime*, and the attention of the whole surgical world was turned to the question of the source of infection. At this time the various bacteria were just being discovered and the surgeons, together with the bacteriologists, finally concluded that it was not necessary so much to sterilize the air around about the field of operation as it was to be clean, and to keep the hands and the instruments of the operator from carrying anything into the wound. This was accomplished by having everything moistened—patient, towel, hands, instruments—in an antiseptic solution. The technic of this method of antiseptic surgery gradually developed and became perfect toward the end of the eighties and the beginning of the nineties. Then it was discovered that antiseptics such as carbolic acid and corrosive sublimate were not at all necessary, but that even better results could be obtained if the field of operation, the dressings, the surgeon's hands, and instru-

ments, were rendered free from germ life; that is, rendered surgically clean. This introduced the era of asepsis, or surgical cleanliness; and the results were so much better than the results of even the antiseptic era that the aseptic method has come into universal use.

Therefore the ideal modern operating-room is one in which no dust or dirt can gather; its walls are without corners or projections, its windows and door casings perfectly plain, smooth and flush with the walls. The sinks and washbowls are reduced to the minimum and so arranged that every part of them can be thoroughly sterilized, and they can be controlled without touching the hands to the faucets. There are provided in the walls of the room flush sockets to which a hose can be almost instantly attached and steam or boiling hot water or a normal salt solution thrown into the room, as may be needed to cleanse the walls, or the floor, or to irrigate the wound. Dressings for the wounds are all sterilized by steaming until they are positively germ free. The instruments are all boiled and the surgeons' hands are scrubbed in hot water and soap for ten minutes and then in a strong corrosive sublimate solution for five minutes more and finally covered with sterile rubber gloves. The place on the patient's body which is to be cut open is thoroughly scrubbed with soap and water, then with the antiseptic, and finally with alcohol and ether until it is as nearly germ free as can be made. If possible, this preparation of the patient is done the night before the operation in order that an antiseptic dressing may rest over the operating field over night, thus providing a greater certainty of cleanliness.

Anesthesia.—Modern surgery depends for its success not only upon this development of surgical cleanliness but also upon the discovery of anesthesia. The use of ether was discovered in 1846, and that of chloroform in 1847. These drugs produce a complete insensibility to pain; and therefore permit more thorough and accurate operation

than could be done with the patient suffering or even conscious. In order to avoid any unpleasant or bad after-effects for the patient when awaking from the anesthesia, it is advisable that the patient's digestive tract be thoroughly cleansed the day before the operation and that no food be taken within four or five hours before taking the anesthetic. It is also extremely advisable after the patient awakes from the anesthesia to keep him quiet and lying very flat (without a pillow), without much water to drink until the anesthetic be somewhat eliminated from the system.

Later than the discovery of chloroform and ether came that of the local anesthetics; notably, cocain and its derivatives. For minor operations where the patient's courage is sufficient to witness it with equanimity, the local anesthetic is preferable. This local insensibility to pain is brought about by injecting a weak solution (2 per cent. to 4 per cent.) of the cocain into the tissues which are to be incised.

Cocain is sometimes injected into the spinal canal to give a freedom from pain, with at the same time a retention of consciousness. This latter method has not found general favor; because it has a good many fatalities connected with it; and the conscious patient is not so easy to work with as an unconscious one. Nitrous oxid gas is also used for a general anesthetic, and as soon as the patient is under its influence followed by the administration of ether or chloroform. This combined anesthesia under skilful administration is probably the most satisfactory for all concerned, but it requires not only a skilful anesthetist but also rather complicated apparatus.

From the above it is easy to see that the *choice of the anesthetic* depends on the character of the operation and also upon the character of the patient. If the operation is a simple and easy one and the patient is quiet and self-controlled, then the quickly passing nitrous oxid anesthesia or the local anesthesia—cocain—is better adapted for the case than the longer and more general anesthetics

—ether and chloroform. The nurse must carefully watch the pulse and respiration of a patient under general anesthesia and not leave the patient alone until he is thoroughly awake. The danger, of course, is usually from heart failure, although the irritation of the lungs may set up an edema or a pneumonia.

The method of attacking a surgical case also depends on whether or not pus is present; that is, whether the case is a "clean" or a "dirty" one. If the case is a clean one, such as a good amputation, and can be kept clean during the operation, the wound may be sewed up tight and the tissues should heal without any formation of pus, and a firm scar-tissue union should be formed within four or five days at the outside. If a dirty case, the wound is left open and kept draining and is irrigated until all pus has disappeared, when the wound heals by granulation. In any case, however, better success attends the operation if no infection is brought in from the outside. We should remember at this point that the principle governing the treatment of all collections of pus in the human body is the same as that mentioned above; viz., the overlying tissues must be cut through and the pus evacuated at the earliest possible moment. Furthermore abscesses and pus cavities must be kept freely draining as long as there is any pus present. The part of the body containing the pus cavity should be kept as nearly at rest as possible.

Operations in Private Houses.—When the operation must be done at a private house, a well-lighted, well-ventilated room which can be kept at 80° F. temperature should be chosen. This should be freed from all unnecessary furniture, the floor covering should either be removed and the floor thoroughly mopped or the carpets should be covered with clean sheets. All pictures and bric-a-brac should be taken from the walls, and the walls rubbed with moist cloths or bread. The greatest enemy of success is dust which might be flying around in the room. Some surgeons take a sterilized sheet and hang it horizon-

tally over the operating table four or five feet above the patient in the hope that this will prevent the flying into the wound of particles of dust. Next, there should be provided for the surgeons an abundance of boiling water, and of cool water that has been boiled and kept covered in clean vessels. Plenty of towels and sheets should be provided. These may be sterilized in a wash-boiler, with slats to keep them from touching the water, which should be an inch or two deep. They should be kept boiling for an hour or two.* The instruments should be boiled in a clean dish from five minutes to a half hour. according to their condition and character. The greatest danger is not that these things should not be thoroughly sterilized, but that ignorant or thoughtless attendants might touch these sterilized dressings or instruments with their hands. Thus, I have known even a doctor to wash up thoroughly and then proceed into the operating room and take hold of the door-knob to open the door. So, again, I have seen nurses in their hurry take hold of the surgeon's instruments with hands which had just been handling the patient or some other object. The best thing for the nurse to do when her hands are clean, is to stand with her hands up in the air as if she were facing a highwayman.

Appendicitis.—Surgical procedure may perhaps be adequately illustrated by the narration of the conditions and indications prevailing in appendicitis. This is an inflammation of the appendix vermiformis, a blind tube from one and one-half to five inches long with a lumen

*The articles needed for an operation in a private house are (Harrison):

Bandages,
1 strong kitchen table,
4 small tables,
3 common chairs,
1 fountain syringe,
3 large basins and pitchers,
1 piece of rubber sheeting for table,
2 slop jars or foot tubs,
1 gallon of hot boiled water,
1 gallon of cold boiled water,
Antiseptic solution (as ordered),
Alcohol,
Safety pins,
Green soap (or synol),
Absorbent cotton,
New wooden nail brushes,
2 dozen towels,
Plenty of clean soft cloths.

varying from one-eighth to one-fourth of an inch in diameter, attached to the cecum about three-fourths of an inch from the ileocecal valve. The appendix has the general structure of the ileum and contains some lymphoid follicles and intestinal glands. The inflammation may be due to the participation of the appendix in a general enteritis or colitis or to some special irritation or infection of the appendix itself. In any case symptoms begin to show when the mouth of the appendix becomes swollen shut, preventing the escape of the products of the inflammation from within the appendix. This causes a swelling of the appendix with the consequent pain and fever. If now the appendix is not opened by nature into the cecum, the side wall will probably be perforated and permit the escape of the purulent contents of the appendix into the peritoneal cavity. If the omentum and mesentery are not lying closely enough to the perforation to dam up the pus, a diffuse general peritonitis results. In this, there is an exudation of serum from the serous membranes, the germs from the appendix multiply rapidly, the bowels become matted together, and covered with this purulent serum and fibrin. Death results from the absorption of the toxins generated in the pus. If the omentum does wall off the pus escaping from the appendix an abscess develops,—or a circumscribed peritonitis.

The symptoms of appendicitis begin suddenly and consist of pain in the abdomen and epigastrium, fever varying from 101° to 104° F., and vomiting. There is exquisite tenderness over the point one-third the way from the anterior iliac spine to the navel. Rarely can any swelling be noted there unless the appendix be already perforated and an abscess formed. If possible, the abdomen should be opened and the appendix removed within forty-eight hours from the beginning of the attack, otherwise the perforation and peritonitis may occur. The symptoms of the peritonitis, besides the general abdominal pain and fever, are chiefly the distention of the abdomen and the

general tenderness. If the operation be performed within the forty-eight hours, one may be able to do a clean operation; that is, encounter no pus. A two to three inch incision is made at the edge of the right rectus abdominis muscle, the muscles of the abdominal wall and their fascia separated in the direction of the fibers, the peritoneum opened by a similar slit with the scissors. The index-finger is inserted into the abdomen, grasps (if possible) the appendix and draws it into the wound. If there are no adhesions, this is a simple matter and the appendix is then clamped, cut between ligatures and the stump inverted and sewed into the cecum. If there are adhesions but no abscess, the adhesions are carefully broken up and the serous membrane carefully sewed over the lacerations, and then the appendix is removed as before. The wound is then closed up and the patient put to bed and kept without solid food for three or four days.

If the operation has been delayed, or if an abscess be already present, then the mass containing the abscess is carefully walled off with towels and the abscess incised and drained. No attempt is made to find the appendix. The wound is left open and thick absorbent dressings applied and the patient put to bed. Here the dressings have to be changed daily until the pus ceases to appear. Then, a secondary operation is done and the appendix removed and the adhesions cleaned up.

If the peritonitis has become general, very little hope can be entertained of saving the patient's life, even by an operation. The pus may be drained off somewhat, but the chief dependence must be placed on supporting the patient's strength, keeping him quiet, and giving him nothing but water by the mouth, applying ice-bags to the abdomen, and using hypodermics of strychnin and other stimulants.

The **emergency treatment of small wounds** forms, of course, an important part of family nursing, and the principles before indicated are those to be followed. In

brief, all wounds should be cleansed out and kept clean and at rest. Suppose a boy, running barefoot, steps on a nail. The correct thing to do is to let the wound bleed as freely as possible and to soak the foot in water as hot as can be borne for at least half an hour, constantly adding fresh water and removing the stained water; of course, it would be better if this washing could be done under a faucet of running water. Then a good antiseptic solution should be injected into the wound. Perhaps the most useful and at the same time perfectly harmless antiseptic for family use is the ordinary solution of hydrogen peroxid. This is not so well adapted to deep, narrow wounds as it is to open cuts. However it may be used, and to use it to the best advantage one should take a medicine dropper or a similar syringe and inject the solution freely and let it foam up, repeating the injection again and again until one is sure that the wound is clean. Another solution which may be used in this way consists of equal parts of camphor and carbolic acid, which should be put into the wound on a swab or probe. Corrosive sublimate solution, 1 : 1000, may also be used.

For an ordinary cut, of the finger especially, where there is danger of infection from uncleanliness of the instrument or of the finger, the best thing to do is to hold the cut finger under running water until it be thoroughly washed; then, if the tissues be brought together, and a bandage be put on to hold them in place, in nine cases out of ten, an early union of the skin will result without any further trouble.

Abrasions of the skin should be treated in much the same way. The surface should be thoroughly washed off with clean warm water or plenty of cold water, if warm water is not at hand, until no evidence of dirt remains; then, the wounded surface should be covered with an antiseptic dressing. If such washing cannot be done, turpentine or gasoline can be supplied with good effect (Gray). If there is considerable fear of sepsis, then the camphor-carbolic solution is probably the best to use. However,

peroxid of hydrogen is sometimes sufficient, and weak solutions of corrosive sublimate are also good. Antiseptic powders, such as iodoform and its substitutes, may also be used. But in general when wounds are so bad that they demand such treatment, it is best to let a physician do the dressing.

Hemorrhage can easily be stopped if one will only bring pressure upon the blood-vessel just above the point where it is severed. Thus, if the blood be coming out in spurts as from an artery, one should go proximally from the cut and find the point where pressure will stop the spurting. Here, of course, a knowledge of anatomy comes into play, and any one with a bit of common sense can usually extemporize a tourniquet by knotting and tying a handkerchief or towel as tightly as possible around the extremity with a block or something to project upon the place where the artery is supposed to be. If it be a vein cut, with the blood coming out in an oozing stream, then the pressure should be made on the distal side of the limb with the same general arrangement; however, this may not be necessary, because veins usually stop of themselves. In any case, the patient should have absolute rest, and the part which is bleeding should be elevated. The same principle applies to internal hemorrhage; thus, if a patient vomit up fresh blood from the stomach, he should be laid flat, and fed small pieces of ice and an ice-bag placed over the epigastrium. A similar line of treatment is used for the spitting of blood (hemoptysis).

Fractures.—Although not belonging directly under this head, fractures might be discussed with a word or two. The best thing that a person can do when he comes across a person suffering from a fracture or dislocation is to support the broken bones as nearly as possible in the position in which he found them. This can usually be done by finding a board and binding the limb loosely to the board. The patient should, of course, be kept recumbent, and in that position be carried as soon as possible to the place

where he can be treated. If it is the back that is injured, even more care is needed not to jar in any way the patient's body. Thus, death has resulted from spinal fracture, because the friends of a patient insisted on putting him in a wagon and taking him for a long trip overland.

CHAPTER XLII.

NURSING IN SKIN DISEASES.

Skin diseases may be due either to local causes such as an abrasion of the skin, a burn, or an irritation from cold or heat, or some local infection; or they may be due to some constitutional condition of which they are only a local manifestation; thus, measles, scarlet fever, smallpox and syphilis all have skin lesions. This last condition, of course, is the one that gave rise in the olden days to the general belief that all skin diseases were due to bad blood, and to the belief in the efficiency of sulfur and molasses and similar homemade remedies for the cure of such conditions. In other words, this old belief being a half-truth was, like most half-truths, more dangerous than the complete error, because it led many people into a feeling of security which was not at all justified.

As far as the nursing is concerned, the treatment of skin diseases follows the same general principles for both classes. This general principle is that there must be provided for all skin lesions a protection from irritation; thus, as we have seen in smallpox, scarlet fever, and similar diseases, we use oil preparations and a very careful regulation of the temperature to provide this protection. Now in a burn or a cut, a bruise or a ringworm, a similar principle must be followed and the exposed nerves protected from irritation or contact with changing tempera-

ture or rough objects. The laity have followed this principle blindly in their almost universal application of salves and ointments to all painful or irritating conditions. The fault of such a universal application is, of course, very apparent;—that frequently applications are made which are not called for, but which, on the other hand, are sometimes positively harmful. In general, however, if a family must act without the advice of a physician or treat an emergency until a physician arrives, it is best to use some oil dressing which is absolutely clean, and if cleanliness cannot be made certain, antisepsis must be provided. By antisepsis we mean the application of something which is inhibitory to germ life. The application of this principle will be seen as we discuss some of the special lesions.

Inasmuch as **burns** produce more than local lesions if the skin of more than two-fifths of the body is affected, the advice of a physician should be obtained for all severe burns; however, until such advice be obtained it is well for those caring for the patient to exclude the air from the wounded surface by the application of a sterile olive oil, sweet oil, linseed oil, or vaselin. If the sterility of this product be uncertain, it is well to add sufficient carbolic acid or thymol or menthol to make a one to two per cent. ointment or emulsion. If none of these things can be obtained, the use of very clean flour or baking soda would, of course, afford some protection.

The next thing to be done in the case of a burn is to afford the burned part as complete rest as possible. If the burn be extensive, the patient should be put to bed. If it be a hand, that hand should be carried in a sling; but one thing which combines these two ideas is to be found in a tub bath of warm water whenever the burn is at all extensive. This protects the denuded area from the air; it also soothes the exposed nerves and permits cleanliness and rapid healing of the parts. It also gives rest to all the involved structures. To make

such a bath, the water should be brought to blood heat—100° to 110° F. The patient should be stretched out in the tub, his head and body supported by some sort of hammock, and the entire body covered with a sheet fastened around the patient's neck so that the patient may lie there and go to sleep. Needless to say, the water should be maintained at a constant temperature, and this requires rather close attention. If the physician who is to take care of the patient were given the choice, he would probably choose this application of hot water in all cases of burns which he must clean up and care for; first, because he would not have to clean away the débris of grease or meal due to the other treatment; secondly, he need not be afraid of infection from these sources; and, thirdly, the parts exposed would be in first-rate condition for him to examine. Therefore, we would recommend this line of treatment as best, and suggest that it be tried whenever possible.

The treatment of abrasions and bruises has been discussed elsewhere. We now take up some of the local disorders.

The so-called **ringworm** is nothing more than an infection of the skin and its underlying tissues with a small vegetable parasite which fortunately does not get into the blood or cause a toxemia. Therefore, the treatment of ringworms is, first, to soften the epidermis affected by the application of hot water or a moist bandage; and, second, to apply to the softened surface some antiseptic strong enough to destroy the parasite. These two results may, of course, be obtained together if one should apply an antiseptic moist dressing at the beginning. Such a dressing might be made of—

Salicylic acid	10 per cent.
Acetanilid	2 " "
Lanolin	88 " "

Since the treatment of this condition is so easy, its principal interest lies in its diagnosis.

Acne, or black-heads, so troublesome to young people from thirteen to eighteen years of age, is due primarily to the blocking up of the skin-glands. If there be nothing besides the normal excretion in these glands, they simply look black and nasty. If the glands become infected and occluded, we have a series of small boils. In young people the condition is usually due to a change in the character and amount of secretion which occurs at this time of life; but the condition in general may be said to be due to the fact that the skin is not massaged and kept in a vigorous, healthy condition. Therefore, the treatment consists in softening the skin through various applications, the best of which is probably steam, and in massaging the skin until the glands discharge the secretion in its normal fluidity.

Lupus is a tuberculosis of the skin. In appearance it has the form of raised, reddened and hardened patches of thickened skin, especially about the face and neck. Its course is very chronic. It demands treatment by the *x*-ray and the Finsen light. Lupus patients should not be allowed to infect their families, for tuberculosis of the lungs (consumption), of the glands (scrofula), and of other organs may arise from the infection. The nurse should therefore treat and dress lupus lesions antiseptically.

A **furuncle** is usually nothing more nor less than a boil. A **carbuncle** is usually simply a collection of furuncles, or a combined furuncle. The danger of these conditions depends entirely upon the cause of the infection. Thus, the streptococcus pyogenes aureus is apt to set up so virulent an infection that the patient will have fever and a severe sickness. Other germs may be virulent enough to produce an abscess, but not virulent enough to set up a constitutional disorder. Sometimes the furuncle is produced, as we have indicated above, from a constitutional infection; sometimes it occurs because a slight cut or abrasion of the skin has become infected. In any case the treatment is the same; namely, to clear out the pus

and drain the abscess freely; therefore, as soon as a feeling of fluctuation can be made out, an opening should be made wide enough to permit of the free evacuation of the contents of the abscess and this incision should be kept freely open until all the pus has disappeared. Practically the only danger that can arise from these conditions is due to a delay in opening the pus sacs.

Eczema is a broad term covering a multitude of conditions of irritated skin due sometimes to primary or local conditions, and sometimes to secondary or constitutional conditions. Thus ivy poisoning produces an eczema; again we find eczema in connection with bad circulation. The irritation of the skin may show itself either in dry scales or white weeping papules. Naturally the first thing to be done in a case of eczema is to make sure of the diagnosis and find out the cause of the trouble. The next is to remove the cause, if local, and soothe the affected areas. Here, again, the exclusion of air by means of some sort of ointments or bandages and the securing of rest to the part form the best method of procedure.

Psoriasis appears in the form of whitened scales especially on the elbows and knees. It is a very obstinate infection, local in its nature. Chrysarobin ointment faithfully applied sometimes cures it.

The *yeast fungi* produce in the skin all sorts of queer lesions. Thus, we have **blastomycosis,** which makes the observer think of a long standing eczema or possibly tuberculosis. This requires very vigorous and penetrating antiseptic applications.

Leprosy might be classed as a skin lesion; but, since it requires constitutional treatment and is very rare, we shall not take up the space for it here.

Lice of various sorts cause skin lesions, especially among the unclean classes of population. Thus, we have *scabies*, or the large body louse, which causes reddened and thickened patches covered more or less with scales. The typical place for the parasites is between the fingers.

The *head louse* (pediculus capitis) mats together the hair, and lays its eggs in the tangles. The *pediculus pubis* does the same for the hair of the arm-pits and pubis. The *pediculus vestimenti* inhabits the clothing and can only rarely be found on the body. Its chief disturbance is the intolerable itching. *Favus* is a disease caused by a vegetable parasite (achorion schönleinii) attacking the hair-roots and scalp. It raises sulfur colored scales and masses. **Alopecia areata** is a similar disease caused by a parasite (trichophyton) which destroys the hair in circular masses, causing baldness in circular areas. *Barber's itch* (sycosis parasitaria) is also an infection with the tricophyton, but one which attacks particularly the beard. It inhabits the hair follicles and necessitates rather extensive depilation to remove the infection.

All these disorders are treated best by simple cleanliness plus antiseptic washes. After the surface is scrubbed as clean as soap and water can make it (the hair having first been shaved), mercurial and sulfur ointments are freely applied and kept renewed for forty-eight to seventy-two hours, when another cleansing of the surface is given. In favus and sycosis it is usually necessary to depilate the affected area rather than shave it.

Herpes zoster is a form of skin lesion in which the herpetic eruption is confined to the area supplied by one nerve or group of nerves. The eruption appears as large, rose-red, watery blisters which may flow together, or may be infected and become purulent. The cause is usually constitutional and may be either toxemia from indigestion, or simply nervous worry. The usual location is about the waist, following the course of an intercostal nerve. This has given it among the Germans the name of girdle rose. The prognosis is good. The treatment consists in applying alcohol and soothing dressings to dry up the eruption, and in relieving the causal condition by the use of constitutional treatment.

Leg ulcers are due to the bad circulation of the blood

and are usually the accompaniment of varicose veins. The treatment is essentially surgical, though they must be treated under the same general principles named above. The bogginess of the surrounding tissue is reduced by tight bandages, the bottom and edges of the ulcer are scraped until the granulations appear healthy, and then the whole is bound up in a soothing dressing. This dressing must be renewed probably thrice a week and the treatment continued two or three months.

In treating the above conditions we see that it is necessary first of all to soften the skin or make it otherwise permeable to the drugs or agents which we are going to use to reach the cause of the trouble lying below the skin. Therefore, the choice of an antiseptic or other agent must be made by some one who knows the relative power of penetration possessed by these things. For this reason, it is usually the most foolish thing that can be done to go to a druggist and ask for some patent medicine that will cure everything from ingrowing toe-nail to rheumatism.

Another point in this connection is the prevention of re-infection. Physicians frequently find that cases which they have apparently cured, break out again either in the same place or some place else. This is due to the fact that the patients are not careful to put on other clothing after their treatment, but use the same clothing that they used before the treatment began; and they simply transfer the germs or parasites from the clothing to the skin which had just been freed from them. This point is specially important in college fraternity houses and similar places where the clothing of one individual is very apt to be worn by some one else, or mixed with the clothing of others. The same care in disinfection should be used in these cases of skin diseases as is used in the various dangerous infectious diseases.

When the skin disease is due to some general condition, of course, it demands no particular treatment beyond that which would reduce the irritation and pain; because

it practically always disappears as soon as the general condition is removed. Now the removal of this general condition is a very important matter and depends greatly on the diagnosis; because if the general condition is syphilis, which is very commonly the case, it means at least three and a half years of constant treatment; while if the general condition be simply a temporary malnutrition, the treatment is rather simple. Frequently these eruptions are due to nervous diseases and these nervous diseases are due in turn to a bad mode of living under unhygienic and improper conditions. Therefore, a skin disease is not one of the simplest things in the world, and should usually receive far more attention than is usually accorded it.

CHAPTER XLIII.

THE CARE OF THE PATIENT AND THE SICK-ROOM.

By Pearl L. Laptad

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The Sick-room.—First, choose the lightest, sunniest, airiest room available. Do away with carpets, if possible. Small rugs are permissible, but not especially desirable. The plainest furniture is best, since it does not harbor dust so badly. All heavy portières and other draperies should be removed. White washable sash curtains may be used since they make the room look fresh and less bare, but these should be taken out and shaken daily, and changed as soon as their freshness is lost. In any sickness not contagious, pictures easily cleaned are not out of place, but little nicknacks should be removed, since they necessitate too much dusting.

A screen covered with plain dark material (dark red or

green being preferable shades) is very useful in protecting the patient from drafts or strong light; for in all cases a window should be kept open (preferably, the lower sash), the open space to be regulated according to the outside temperature. A towel may be pinned firmly across the open space to reduce the draft. In almost all cases, excepting only those where the eyes are affected, there should be light and sunshine in the room. Dark window shades are far more satisfactory than light ones for the sick-room.

Remember that rickety, creaking furniture, noisy hinges and latches, banging doors and rattling windows (and, I might here add, squeaky shoes and shoes without rubber heels), may mean almost agony to the patient, and may keep off many minutes of sleep. Ill-chosen wall-paper in the room may bring all sorts of wretched fancies to the sick mind, especially when the patient is bordering on delirium. A sick-room is needed in every household, and every family should bear this need in mind when papering is being done, and select inconspicuous figures or plain tinted papers for sleeping rooms.

For the convalescent patient a large deep-seated rocking chair with arms (fancy shapes are not as agreeable as plain ones) and a good foot stool are needed.

As to the *care of the room:* If a carpet is already down, a carpet sweeper should be used, or damp tea leaves should be sprinkled over the floor before sweeping to gather the dust and prevent its rising, especially in diseases of the throat and lungs. In general, the greatest care should be used to keep the dust out of the air.

When rugs are used, they should be taken out daily and thoroughly swept on both sides, or well beaten and occasionally wiped with a cloth dampened in salt water. Unless the rugs are new, before using them in the sick-room, it would be best to have them scrubbed with the following solution: Water, 1 quart; naphtha soap, 1 bar; soda bicarbonate, 1 tablespoonful.

Bare floors should be swept daily with a covered broom, or one of the brooms made especially for polished floors; and, if washable, should receive three or four washings a week with damp cloths (not sopping wet) wrung out of clean water. A clean slightly damp dust-cloth should be used over all the furniture and ledges of woodwork daily. The polish on furniture may be preserved by drying, immediately after wiping, with a soft dry cloth. Window panes and mirrors should be kept free from dust.

All basins, pitchers, soap basins, slop jars, bed-pans, vomit basins, and sputum cups should be kept absolutely clean, shining, and odorless by a daily cleaning with soap or bon ami and hot water. A small brush, such as a five cent nail-brush, is very efficient in the cleaning of such utensils.

If possible have at least one clean towel daily, and keep towels hanging in the room, neatly folded.

Growing plants in the room are not only cheering, but beneficial to the patients. Cut flowers should have stems washed and the water changed daily, and should be thrown away when no longer fresh.

Keep all unnecessary articles out of the room, and remember that an orderly room is restful to patient, nurse, and doctor.

General Daily Care of the Patient.—As soon as possible after the patient wakes in the morning, wash the face and hands, drying thoroughly and carefully, cleanse the mouth well (the most satisfactory mouth wash, because it penetrates to folds and spaces not reached by the tooth-brush or swab, is peroxid of hydrogen); tidy the hair (if long and heavy, the combing may be left until after the bath); straighten out the bedding; serve nourishment.

An hour or more after the nourishment has been taken, a sponge bath may be given and the bed made. After having made the patient as comfortable and presentable as possible, the room should be cleaned.

During the day, keep the bed as orderly as possible without annoying the patient and pay special attention to your patient's personal appearance, as even sick people feel worse for looking disorderly. Remember to cleanse the patient's hands before and after taking nourishment.

Soon after waking in the morning, soon after the mid-day meal, and when being prepared for the night's rest, the patient should use the bed-pan, thus establishing if possible a regular time for voiding urine and making sure that that important function is not overlooked, since patients lying quiet may not feel the necessity of urinating even when there is a considerable quantity of urine in the bladder.

Regular habits of defecation may be encouraged when enemata are used, by having a regular hour for the daily enema; and if laxatives are given, they should be administered at the same hour each day.

In preparing the patient for the night, bathing the face and hands and back with warm water, and rubbing the back soothingly for ten or fifteen minutes or longer with alcohol (50 per cent.); then smoothing the draw sheet, brushing out all crumbs, etc., shaking the pillows, and straightening the covers do much toward making the night more restful. Do not forget that most patients like to have the gown drawn well down toward the feet. These little attentions are especially grateful to restless patients who have just undergone a surgical operation.

As few visitors as possible should be admitted. At any rate, not more than two should be in the sick-room at once. Only one is still better. Gossipy and hypochondriac visitors should be absolutely barred.

The Bed.—The best bed is the modern, plain, strong washable, single, iron bed with the fewest possible dust-catching contrivances and ornaments, and with firm woven-wire springs.

The mattress should be of hair, though a felt or cotton one does very well provided it be smooth and firm. There

should be a mattress pad of quilted cotton or a smooth comfort, large enough to extend at least across the middle third of the mattress, but, better, the full length of the patient's body. There should be used three sheets, a rubber (or oil-cloth) draw sheet one yard wide and three-fourths of a yard longer than the width of the bed, and preferably blankets for covering, since they are lighter, warmer (because falling more closely about the patient), washable and more quickly aired than comforts. A white spread for the final covering should be provided.

The pillows may suit the patient's preference or the needs of the case. Tiny pillows are very useful to slip in under the back, or under the shoulders, or hips, to change the position a little, especially when the patient needs to be mostly on the back.

One of the difficulties met with even in the homes of families far removed from poverty is a very inadequate supply of bed linen and blankets. It should be impressed upon the minds of housekeepers that to be prepared to care properly for a member of the family who becomes ill, a number of changes of bedding is necessary. What would commonly be called extravagance in the supply of bed linen, towels, and night-gowns, in a nurse's opinion is only a necessary supply.

To Make an Unoccupied Bed.—Fold off neatly each piece of linen and covering and hang over the head and foot of the bed and chairs to air, so that the room may not look untidy or the bedding become mussed.

Brush the mattress well on both sides with a whisk broom, spread the pad where it will best protect the mattress from perspiration or other excreta, spread the bottom sheet smoothly, tucking in firmly several inches at the head, since that is where it is most apt to work loose, draw it tightly and tuck in well at the sides, and at the bottom if long enough.

Then place the rubber draw sheet across the middle of the bed, covering it with a sheet folded the same width,

and tuck both in very tightly under the sides—for a very restless person, a draw sheet placed beneath the mattress to which the upper draw sheet may be pinned is a good arrangement. Tuck the top sheet in several inches at the foot, drawing it smooth, and folding the corners neatly when the sides are tucked in. Spread each blanket on smoothly, tucking in the same as the top sheet. Turn the top sheet back over the blankets for a few inches at the head. When the spread is put on, tuck it in several inches at the foot, arranging the sides so as to hang with a neat fold at the corner.

Lay the pillows on smooth and flat, seams of cases to the head, and open ends away from the door.

To Make the Occupied Bed.—Often the mistake is made of letting very weak persons with high fever and rapid pulse sit up while the bed is being made. This is sometimes a disastrous undertaking and is always unnecessary.

If the linen is to be changed when making the bed, have the room warm, loosen the covering and sheets all around, fold the spread and hang over the foot of the bed, take off all but one single blanket, fold other blankets and place over back of chair, carefully draw the top sheet down and off from under the remaining blanket, fold or place in laundry bag. Place patient on his side at the farther side of the bed. With a very weak patient who should not exert himself because of heart weakness, as in pneumonia, diphtheria, typhoid, etc., or for fear of hemorrhage or nausea, move him very gently to the desired side of the bed by drawing easily and steadily on the bottom sheet; then, by lifting slightly and pulling gently but with strength on the sheet at the patient's back, turn him on his side. A pillow may be placed in front to support his body while the nurse supports his back as much as possible while changing the linen. When there is any danger of chilling a patient, a warm pillow should be used, and the side of the bed to which he is moved should be warmed

with hot water bottles or bricks. When changing such a patient's bed, and linen, assure him before you begin that you know just how to do it without any exertion whatever on his part, and go about it easily, taking sufficient time not to tire him. In moving him from side to side see that his head is not uncomfortable.

With the patient on the farther side of the bed, to remove the bottom sheet, fold it flatly or roll it longitudinally from the outer edge as close as possible to the patient's back (under the rubber draw sheet). Lifting and folding back the rubber draw sheet, sweep the mattress and pad with a whisk broom, being careful not to jar the patient. Place the clean sheet so as to allow four inches for tucking in at the top and tuck it in firmly at the side. Fold the farther half of the sheet flatly against the patient's back and shove under the folds of the soiled sheet; then draw down and tuck in the rubber draw sheet, the soiled muslin draw sheet being flatly folded against the patient's back; then put on the clean muslin draw sheet, tuck in firmly at the side and lay in folds next the patient's back under the soiled muslin draw sheet. By drawing gently on the soiled draw sheet with the right hand, while holding the clean sheet in place with the left, the patient may be easily brought over the ridge of folded sheets and gently rolled over on to the clean bedding by turning him with the soiled draw sheet (the nurse having gone to the other side of the bed). Again, place the pillow in front of him for support while the soiled sheets are removed from the other half, the mattress and pad well brushed, and the clean sheets drawn tightly and tucked in place. Of course, to manage a heavy patient in this way (not allowing any exertion on his part), the nurse needs an assistant; while with a patient who is able to be helpful much of the carefulness as to detail may be unnecessary.

The top sheet, blankets and spread may be put on as described before, with the exception of the spread, which

should turn in over the blankets at the top, and the sheet back over all for a few inches.

Draw out the covering blanket after placing the top sheet.

To make the bed when the linen is not to be changed, fold off covers just as here described, place the patient on the side of the bed while draw sheet and bottom sheet are rolled back to expose pad and mattress for brushing, replace sheets, put patient on the made side of the bed while the other side is treated the same way, then replace the covering as before described.

In making the bed always bear in mind the condition of your patient's strength and his tendency to chilling and take all precaution to conserve his strength and warmth, as this may be an important, if apparently small, factor in aiding his recovery.

A cup of hot nourishment may be given to a weak patient after the disturbance of bed changing, and a hot-water bottle may be placed at his feet.

To Change the Gown.—Draw the gown well up under the shoulders, unbutton it, and if it is long enough slip it off of one shoulder and arm, draw it over the head and off over the other shoulder and arm. Or if small let the patient lift himself slightly by placing his hands on the nurse's back, while she slips the gown over the shoulders. Very weak patients' gowns should be split up the back so that they may be easily slipped off and on without tiring the patient. It is quite easy, if care is used, to change a gown without uncovering the patient.

To Give a Sponge Bed Bath.—Have ready on a chair beside the bed the fresh linen, two bath blankets, bath and hand towels, and two wash cloths. On a table at the bedside have a nail-brush, scissors, toothbrush, soap, alcohol (50 per cent.), powder, comb, and an envelop or other receptacle for combings. Lastly, bring in the pitcher of warm water and the slop jar.

Before beginning the bath, fold off the covers, the

same as for bedmaking, placing a bath blanket under the patient, tucking it in smoothly at the sides. Remove the pillows, cover the patient with the other bath blanket, and remove the gown, keeping the body from exposure by the covering blanket. Wash in order given—face, ears, neck, arms, chest, abdomen, legs, feet. Get fresh water. Turn the patient on the side, wash the back, rub with alcohol, and apply the talcum powder. With a special wash cloth, wash between the thighs. Put on the gown. Change linen, if necessary, when removing the bath blanket, and make up the bed properly. Cleanse the teeth, attend to the nails, place a towel under the head, and comb the hair.

During the bath there need be very little exposure of the patient's body. When washing the limbs place the bath towel underneath, and when washing the back place the towel close against the back. Thus, the towel is ready for immediate use and the blankets do not get so wet.

To Give a Temperature Bath (for reducing temperature).—It is best to have a long rubber sheet underneath the bath blanket, and cover the patient with a sheet. Place some absorbent cotton in the ears. Keep the water at 65° F., or as ordered by the physician; and use two large wash cloths alternately. Keep cold cloths on the head and abdomen continuously, changing them frequently. Sponge face and neck; then arms, chest, legs, and finally the back. Give long, light upward strokes, using a very wet cloth. The back should be sponged downward. Sponge each section about five minutes, spending the most time on the parts where the blood-vessels are nearest the surface. The whole bath should last about thirty minutes.

With some patients it is more agreeable and results are better to sponge each part first with water slightly warmed, and then with the cold; but the doctor's wishes must be consulted in the matter.

Serving Food and Medicine.—As a rule, the patient's appetite is poor and the diet so restricted as often to become very monotonous in spite of the nurse's efforts; so the most we can do is to be very careful in the preparation of the food and serve it in as attractive a way as possible.

A glass of milk, a bowl of broth, or a cup of hot water, is not too insignificant to be nicely served. A plate or small freshly covered tray should always be used in serving such articles. A little garnishing and the daintiest dishes available are certainly more to be thought of where the food is not so tempting, than when many good things can be served. Even the glass of water should be carried on a plate or tray.

Sometimes covering the food not only protects it from dust but gives an air of mystery that arouses the patient's interest. The nurse should use all her wits to serve her patient's food in a variety of ways by changing the methods of preparation, the garnishing, and dishes, so that even a milk diet may be made to have some charms.

Always serve hot things piping hot; and cold things very cold; and never allow left over food to stand in the room. If desirable to have a pitcher or glass of water by the bed, it should be kept covered.

As to the giving of medicines they too should be served attractively, or at least interestingly, by arranging medicine glasses nicely on a plate or tray; and serving with the drug a glass of cold water; and, if allowable, with unpalatable doses, serve a dainty glass of fruit juice (not too sweet) or a few sections of orange. The patient may look pleasantly upon even a dose of salts tactfully served.

Always serve pills from a spoon, carrying the glass of water on a plate, with the spoon containing the pill beside it.

Powders may be more easily given from a dry spoon and dropped well back upon the tongue. Keep medicine

bottles and boxes out of sight as much as possible, not even measuring out the dose at the bedside.

In Case of Death.—In case of death, the nurse should first notify the physician if he happen to be not present. Then she should gently lead the family from the room in order to cleanse the body and put the room in order. The entire body should be washed in alcohol or an antiseptic solution. The rectum and vagina should be plugged with cotton. The mouth should be held shut by some object placed between the chin and chest. The eyelids should be kept closed with moistened bandages or cloths until they stay down of themselves. If the patient have died of an infectious disease, the body should be covered with a sheet wrung out in a 1 : 1000 solution of corrosive sublimate. In most cases the embalmer relieves the nurse of many of these details, but she must be ready to do them.

Disinfection with Sulfur.*—(*a*) Have all windows and doors (except door of egress) tightly closed. Securely paste strips of paper over keyholes, over all cracks, above, beneath, and at sides of windows and doors, over stove holes, and all openings in walls, ceiling and floor. If opening be large, paste several thicknesses of paper over opening. Carefully stop up the fireplace, if there be one. There must be no opening through which gas can escape.

(*b*) All articles in the room that cannot be washed should be spread out on chairs and racks. Clothing, bed covers, etc., should be hung on lines stretched across the room. Mattresses should be opened and set on edge; window shades and curtains spread out at full length. If there is a trunk or chest in the room, open it but let nothing stay in it. Open the pillows so that the sulfur fumes can reach the feathers. Do not pile articles together.

(*c*) Use four pounds of powdered sulfur for every 1000

* From the Bulletin of Illinois Board of Health.

cubic feet in the room. A room ten feet long, ten feet wide and ten feet high has 1000 cubic feet. For a large closet, use two pounds of sulfur.

(*d*) Burn the sulfur in an iron pot or deep pan. Let the pot or pan stand in a large vessel containing water, which vessel should be placed on a table, not on the floor. For example, take a common wash-tub, lay in it three or four bricks, pour in boiling water to the level of tops of bricks, put the pot or pan containing the required amount of sulfur on the bricks, place the washtub and contents on a table. The disinfecting "apparatus" is then in working order.

Moisten the sulfur with alcohol and ignite. When the sulfur begins to burn, leave the room, close the door of egress, and carefully paste strips of paper over the key-hole and all openings above, beneath and at side of door. Keep the room closed for ten hours at least, twenty-four if possible.

Disinfection with Formaldehyd.*—The process now unreservedly recommended by the Board consists merely in pouring formaldehyd solution over crystals of potassium permanganate. This method offers the advantage of absolute simplicity in operation, requiring no special apparatus and no fire. In addition to this, exhaustive experimental work has demonstrated that in practical disinfection the method is unusually efficient, regardless of the conditions of humidity, temperatures, and other factors which materially affect other methods of the use of formaldehyd.

The only apparatus required is a large open vessel, protected by some nonconductive material to prevent the loss of heat from within. A fourteen-quart milk pail, set into a pulp or wooden bucket, will answer every purpose; although a special container devised for physicians and health officers will be found of considerable advantage. This container or generator consists of a

* From the Bulletin of Illinois Board of Health.

simply constructed tin can with broad, flaring top. Its full height is 15½ inches, the height from the bottom to the flaring top being about 8 inches. The lower or round section is 10 inches in diameter, while the flaring top is 17½ inches in diameter at its top. The container is made of a good quality of bright tin, is supplied with a double

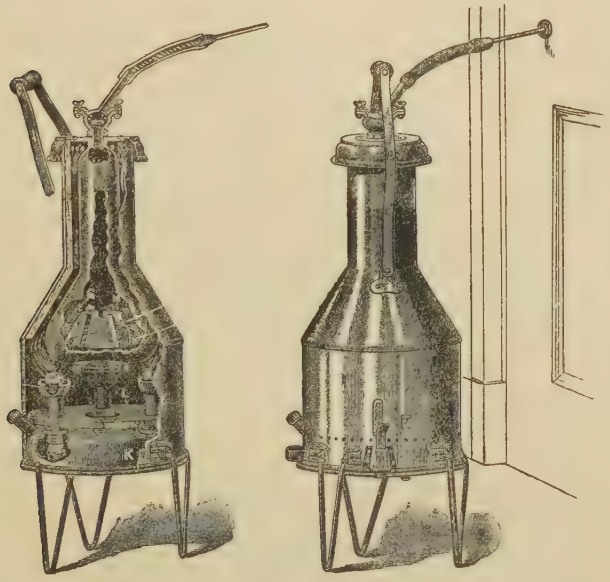

Fig. 32.—1, Sectional view of the Trenner-Lee disinfector; 2, the Trenner-Lee disinfector in position outside of room to be disinfected. Remove door-knob and knob bar, and insert the end of the tube in the opening.

bottom with a one-fourth inch air-space between the two layers, and is entirely covered on sides and bottom with asbestos paper. The asbestos paper and double bottom serve effectively to retain the heat which is generated by the vigorous chemical reaction occurring within, and which is essential to the complete production and libera-

tion of the gas. This special retainer can be made by any tinner of ordinary intelligence, and costs but a few dollars.

With the room sealed, as described above, and as is essential to any form of aerial disinfection, the crystals of potassium permanganate (10 ounces to every 1000 cubic feet of room space, or 13½ ounces when the temperature is below 60° F.) are placed in the container. Over this salt is poured "formalin," or the 40 per cent. aqueous solution of formaldehyd (24 ounces to every 1000 feet of room space, or 32 ounces when the temperature is below 60° F.). The formaldehyd gas is promptly liberated by the vigorous chemical reaction of the formalin and potassic salt, and rises from the generator in immense volume in the form of an inverted cone. It is consequently necessary that all preparations be made in advance, and that the operator leave the room at once on the combination of the two chemicals.

The door or window of exit will be promptly closed and sealed, and the room left closed for at least four hours.

CHAPTER XLIV.

EMERGENCIES.

Acute Poisoning.

The first thing to do when we find a patient who has swallowed a poison is to try to empty the stomach of all the unabsorbed poison. If we have reason to believe that all the poison is absorbed, then we should turn our attention to neutralizing it and to keeping the victim alive. But, in most cases, it is well to begin our treatment by emptying the stomach. The quickest way to do this is to use the stomach tube and flush out the stomach with milk, if we are dealing with a corrosive

Fig. 33.—Artificial respiration by swinging the arms from the sides to over the head.

Fig. 34. -Artificial respiration by alternate compression and relaxation of lower ribs.

poison such as carbolic acid; or with water, if the poison be from putrefaction; or with a one per cent. solution of potassium permanganate if the poison be morphin or opium; or with a soda or other alkaline if the poison be an acid; or with weak vinegar or other acid solution if the poison be an alkali, etc. In case no special solution can be had quickly or while such a solution is being made, flushing the stomach with clear water will be helpful.

In order to neutralize the poison already absorbed, we must know pretty accurately what it was. For instance, alcoholic drinks by the mouth and hypodermic injections of atropin ($\frac{1}{50}$ gr.) are useful in morphin poisoning. For strychnin, hypodermic injections of nitroglycerin ($\frac{1}{50}$ gr.), inhalation of amyl nitrite, swallowing of tannic acid and sodium bromid solution.

More, however, can be hoped for by one not a trained physician from efforts to keep the patient alive until help can come. Thus, when the victim seems almost gone, artificial respiration should be used by having the patient flat on his back, and then compressing rhythmically the lower ribs at the rate of about fourteen compressions to the minute. With strong and burly men, it may be necessary to use the arms as levers, swinging them up and outward and then back over the chest. Children may be kept breathing by raising the legs by the ankles until the back is bent and the abdomen compressed. If, however, as in the case of drowning, there is something in the trachea or lungs, the patient should be put on his face and raised over a roll of clothing or a barrel, alternately by the lower ribs and shoulders. Sometimes, the breathing can be maintained by slapping the chest with ice-cold water—doing it rhythmically as in all methods of artificial respiration. Again, pulling the tongue rhythmically may help keep the respiration going.

In opium and morphin poisoning, the danger is in letting the patient go to sleep. After his stomach has been emptied and he has been given hypodermics, strong

coffee should be given him and he should be compelled to walk—under the lash if necessary—until the danger is passed.

Ptomain poisoning is very common, and should be met with prompt treatment. The stomach and bowels should be evacuated. A hypodermic of one-tenth of a grain of apomorphin, followed when the vomiting has subsided by plentiful doses of castor oil and salts, will do much toward accomplishing this. The type of poisoning is usually that of belladonna (atropin) with its dryness of the throat, rapid heart-beat, etc. For this reason, hypodermics of pilocarpin (⅓ gr.) and sweat baths (hot packs) will be found useful. Artificial respiration should be kept up a long time when needed (even two hours, if necessary).

The following list of poisons taken from Dorland's American Medical Dictionary, their symptoms and treatment, will be found useful for reference.

A TABLE OF POISONS AND POISONING.

Drug.	General Symptoms.	Antidotes and Treatment.
Acetanilid.	Sweating; cyanosis; soft, weak pulse; hemoglobin and hematin in urine.	Heat; stimulants; strychnin; belladonna; oxygen inhalation.
Acid, Acetic (vinegar).	Similar to those caused by the mineral acids.	Alkalies, such as sodium and potassium bicarbonates; magnesia and soap; flax-seed-tea; milk or large quantities of warm water; olive oil.
Acid, Carbolic (Creosote).	Gastro-enteritis. Violent vomiting and purging; burning pain over entire abdomen; skin covered with sweat; face pinched and anxious; thready, imperceptible pulse; great dyspnea; coma; contracted pupil; sometimes convulsions; collapse.	The soluble sulfates, chiefly Epsom and Glauber salts; mucilaginous drinks; hot application to the skin; counter-irritation over the abdomen; respiratory and cardiac stimulants; strychnin and digitalis; hypodermic injections of ether and dilute sulfuric acid.
Acid, Chromic.	Pain in abdomen; purging; vomiting; yellow stains; collapse.	Stomach pump; chalk, milk, or albumen; mucilaginous drinks.
Acid, Hydrochloric (muriatic acid).	Violent gastro-enteritis.	Alkalies, soaps, oils, and white of egg.

A TABLE OF POISONS AND POISONING.—(*Continued.*)

DRUG.	GENERAL SYMPTOMS.	ANTIDOTES AND TREATMENT.
Acid, Hydrocyanic (prussic acid).	Difficult respiration, expiration being prolonged; slow cardiac action and disturbed cerebration, followed by convulsions, unconsciousness, wild cries, dilated pupils, vomiting, involuntary urination, and defecation, erection of penis, ejaculation of semen, asphyxia, cyanosis, paralysis, and general collapse.	No known antidote. General stimulation; atropin hypodermically; ammonia by inhalation, by the mouth, or intravenously; artificial respiration; alternate cold and hot douches to the chest.
Acid, Nitric.	Violent gastro-enteritis. Tissues stained deep yellow.	Alkalies; chalk, magnesia, whitewash, and soap.
Acid, Nitromuriatic (nitrohydrochloric acid).	Similar to preceding. Tissues stained deep yellow.	Similar to preceding.
Acid, Oxalic.	Burning in the esophagus, followed by gastric irritation; intense abdominal pain; vomiting of highly acid, greenish, blackish-brown, or bloody mucus; livid surface, cold skin, stupor, collapse, and sometimes convulsions.	Chalk, or lime scraped from a wall. *Not* the salts of potassium and sodium, as they form soluble oxalates. Apply general treatment for gastro-enteritis.
Acid, Sulfuric (oil of vitriol).	If protracted, pain in the mouth, throat, and epigastrium; violent vomiting, often of blackish matters; cold extremities; clammy skin; suppression of the voice; swelling of the parotid glands; profuse salivation, which is sometimes bloody, followed by symptoms of general collapse. Tissues affected stained black.	Alkalies; magnesia, chalk, whitewash, soap, oils, and opium; application of external heat.
Acid, Tartaric.	Gastro-enteritis.	Alkalies; magnesia, lime, carbonate of sodium or potassium, soap. The after-treatment is that of gastro-enteritis.
Aconite.	Tingling in throat and extremities, marked general relaxation; anesthesia of surface; pulse slow, weak, intermittent; respiration shallow, slow, feeble; skin covered with cold sweat; countenance pale, anxious; protrusion of eyes; pupils generally dilated; diplopia; often loss of voice and sight; sometimes gastric burning and convulsions; consciousness may be preserved; body temperature lowered.	Hypodermic injections of ether, alcohol, especially *digitalis*. Place patient in prone position and *absolute* quiet, head lower than feet. Endeavor to wash out stomach, but *avoid* emetics. External heat; atropin; ammonia; artificial respiration.
Alcohol.	General relaxation, stupor, anesthesia; coma; pulse rapid, weak, compressible; skin cool, moist; some unconsciousness; face pallid; body temperature lowered; breathing somewhat stertorous. Symptoms resembling opium poisoning and apoplexy; sometimes convulsions.	Evacuate stomach; alternate cold and hot douches; external heat; atropin, caffein, strychnin hypodermically.

A TABLE OF POISONS AND POISONING.—(*Continued.*)

DRUG.	GENERAL SYMPTOMS.	ANTIDOTES AND TREATMENT.
Ammonia.	A local powerful irritant. General gastro-enteritis; intense abdominal pain; bloody purging; symptoms of suffocation; convulsions. Consciousness is preserved, but stupor or coma may be developed.	Neutralization by vinegar or dilute acids. If edema threatens life, tracheotomy should be instantly performed. Oils, such as linseed, almond, or others, may be administered.
Antimony (tartar emetic).	Weak and slow pulse; skin moist and relaxed, followed by violent gastro-intestinal irritation; vomiting of mucus, bile, watery fluid, and sometimes blood; purging, first of contents of intestines, then, mucus, bile, and sometimes blood, followed soon after by peculiar *rice-water* stools. The pulse is then imperceptible at the wrist; the respirations are shallow; the face becomes pinched, livid, and covered with sweat; cramps of the leg, accompanied by spots of anesthesia, and great fall of the bodily temperature. The whole symptomatology points to Asiatic cholera, from which the metallic poisoning can only be distinguished by chemical analysis. Sometimes, especially in protracted cases, there may occur tremblings, delirium, unconsciousness, clonic and tetanic convulsions.	Chemical antidotes, tannic acid, or astringent infusions of oak-bark, galls, etc., followed by ingestion of white of egg. Other measures should consist in placing the patient in a prone position, with the head lower than the feet; general stimulation; application of external heat; ingestion of alcohol, and especially of digitalis hypodermically, as cardiac stimulants; opium, to allay irritation and pain, provided respiration be not feeble.
Antipyrin.	Chilliness, profuse perspiration, slight cyanosis, a rash resembling that of measles, headache, nausea, lowering of blood-pressure, respiratory failure.	Stimulants, warmth, atropin, strychnia, inhalations of oxygen, artificial respiration.
Apomorphin.	Severe vomiting, delirium, paralysis of motion and sensation, cardiac and respiratory depression.	Stimulants of heart and respiration.
Arsenic (arsenous acid; Scheele's green; insect powder).	Active irritation, accompanied by colicky pains, intense burning of the esophagus and stomach; sense of constriction in the throat and an acrid, metallic taste in the mouth; violent vomiting and purging; matters rejected: at first mucus, and then bilious, of a yellowish or greenish color. The stools may become finally serous, and not infrequently bloody. Pulse feeble, small, and frequent; respiration rapid, labored and painful; excessive thirst; suppression of urine; more or less swelling of the face; ice-cold extremities; surface cyanosed, followed by cramps, convulsions, coma, and death. In more or less protracted cases	Chemical antidote: *hydrated sesquioxid of iron.* This may be prepared in an emergency by adding ammonia to the tincture of chlorid of iron, and washing the precipitate with water; or Monsel's solution and the so-called dialyzed iron may be employed instead of the tincture. The ferri oxidum hydratum cum magnesia, made by precipitating the solution of the tersulfate of iron by magnesia, is perhaps the *best* antidote. This should be followed by the administration of castor oil, demulcent drinks, opium, external heat, and stimu-

A TABLE OF POISONS AND POISONING.—(*Continued.*)

DRUG.	GENERAL SYMPTOMS.	ANTIDOTES AND TREATMENT.
	there may appear an eruption on the skin which is either petechial or uticaria-like, papular, vesicular or pustular.	lants; large drafts of water containing sweet spirits of niter, especially if there be a tendency to suppression of urine.
Belladonna (atropin).	Dryness of mouth and throat; increased cardiac action; rapid breathing; flushing of face; dilated pupils; wild, talkative, delirium; scarlatinous, non-punctuated rash; sometimes laryngitis, roughness of voice, with expectoration of minute, pearly pellets; then stupor, followed by paralysis; cold extremities; retention of urine.	Evacuation of stomach; early use of catheter; *tannic acid;* external heat; stimulation by mustard; pilocarpin best physiologic antidote; caffein; physostigma; alternate cold and hot douches; artificial respiration.
Bloodroot.	See "Sanguinaria."	
Caffein.	Burning in throat, vertigo, nausea, faintness, and numbness, thirst, parched tongue, abdominal pain, tremor, weak pulse, cold skin, collapse.	Emetic, heat, stimulants atropin, and morphin.
Calabar bean (physostigma).	Giddiness; muscular tremors; complete muscular relaxation; *pupils contracted:* respiration slow, irregular; loss of reflexes; vomiting and purging, but both often absent.	Evacuate stomach; atropin best physiologic antidote; external heat; stimulants; artificial respiration.
Calcium (slaked lime).	Those of a powerful caustic; gastro-intestinal inflammation.	Similar to the preceding, with the ingestion of milk and mucilaginous drinks.
Camphor.	Burning pain in abdomen; vertigo; prostration; cyanosis; delirium; convulsions; quick, weak pulse; clammy skin; odor of camphor.	Emetics; heat, stimulation; alcohol.
Cannabis indica (Indian hemp).	Sense of exhilaration; peculiar prolongation of time and sense of double consciousness, followed by drowsiness, anesthesia, loss of power, especially of lower extremities; *pupils dilated;* rapid pulse; slow breathing; sometimes convulsions.	General stimulation; belladonna or atropin; artificial respiration.
Cantharides (Spanish flies).	Violent gastro-enteritis; burning sensation in pharynx and esophagus, with sense of constriction of throat; burning pain in back, bladder and urethra; priapism; often great thirst; vesical tenesmus; sometimes sloughing of genital organs; stupor, coma; sometimes violent delirium and tetanic convulsions.	No known antidote; evacuate stomach; albuminous or mucilaginous drinks; *avoid* oily substances; opiates to lessen irritation and pain; leeches to epigastrium; anesthetics.
Carbon Dioxid.	Vertigo; headache; cyanosis; sleepiness; coma.	Artificial respiration; oxygen-inhalations; counter-irritations; electricity.

A TABLE OF POISONS AND POISONING.—(*Continued.*)

DRUG.	GENERAL SYMPTOMS.	ANTIDOTES AND TREATMENT.
Chloral.	Complete muscular relaxation, followed by sleep and coma; respiration slow, shallow, feeble, labored; pulse slow, then rapid and thready; face white, livid, covered with cold sweat; pupils contracted, then dilated; great fall of body-temperature.	Emetics; strychnin; atropin, digitalis, ammonia, ether; alcohol hypodermically. Place patient in prone position, with head lower than feet. Keep patient roused. Artificial respiration; oxygen by inhalation; external heat.
Chloroform.	Stertorous, irregular, shallow respiration; dilatation of pupils during anesthesia, and a peculiar shade or cloud passing over the face of patient, are the most dangerous symptoms.	Remove drug, and immediately invert patient; alternate hot and cold douches; hypodermic injections of strychnin, atropin, and digitalis; electricity and artificial respiration. *Avoid* subcutaneous injections of ether and alcohol; ammonia instead, hypodermically or intravenously.
Cocain.	Vertigo; nausea; faintness; small, rapid pulse; slow respiration; dilated pupil; prostration.	Stimulants; artificial respiration; amyl nitrite.
Codein.	See "Opium."	
Colchicum.	Gastro-enteritis; profuse salivation; nausea, retching, griping; intense abdominal pain; great tenesmus; violent purging; rapid pulse, then slow; sense of prostration and great weakness; skin cold, pale, bedewed with sweat; spasms frequent; muscular pains and convulsions sometimes; collapse.	Emetics and cathartics; tannic acid; warm water freely; also white of egg; albuminous drinks; demulcents; opium.
Conium (hemlock).	Giddiness; staggering; disturbed vision, followed by complete muscular relaxation; nausea, sometimes vomiting; frontal headache; *ptosis* of eyelids; *dilated pupils;* pulse slow, then increased; sometimes salivation and sweating.	Evacuate stomach; tannic acid; strychnin, atropin, caffein, digitalis, hypodermically; external heat; artificial respiration.
Copper.	Burning pain in stomach; copperish or metallic taste in mouth, followed by gastro-enteritis; vomiting of bluish liquid; stools consist at first of contents of intestines, becoming then glairy, mucous, or bloody; excessive salivation and bronchial secretion; constant expectoration; epileptiform convulsions; delirium; anesthesia; sometimes syncope and jaundice; lessened amount or suppression of urine, which is sometimes black.	Chemical antidote: the yellow prussiate of potassium. Demulcent drinks; oils; white of egg; milk; if no emesis has occurred, emetics and the stomach-pump; opium to allay irritation and pain.
Corrosive Sublimate.	See "Mercury."	
Creasote.	See "Carbolic Acid."	

A TABLE OF POISONS AND POISONING.—*(Continued.)*

DRUG.	GENERAL SYMPTOMS.	ANTIDOTES AND TREATMENT.
Croton Oil.	Those of violent gastro-intestinal inflammation.	Mucilaginous drinks; demulcents; opium; general stimulation.
Cyanid of Potassium.	See "Hydrocyanic Acid."	
Digitalis (foxglove).	Violent vomiting of mucus and bile; intense headache; disordered vision; vertigo, salivation; pulse slow, full, strong, *dicrotic*, becoming weak and rapid on patient rising, although heart beats violently; face pale; *blue color of sclerotic; pupils dilated*, sometimes contracted(?); eyeballs bulging; diarrhea; suppression of urine; pain in back and limbs; consciousness generally preserved, but late in poisoning delirium; then stupor, convulsions, and coma.	Tannic acid; then emetics or stomach-pump; aconite, best physiologic antidote but use cautiously. Place patient in horizontal position, in absolute quiet; opium; external heat, especially about abdomen.
Ergot.	Not well defined, but often gastric irritation, thirst, and diarrhea; burning pain in feet; dizziness; tingling of fingers; cramps in all extremities; *pupils dilated;* pulse small, feeble; *marked coldness of surface;* sometimes convulsions; miscarriage or abortion in pregnant women.	General stimulation, with application of external heat.
Ether.	Cyanosis; pulsation of jugular veins; *failure of diaphragmatic action*, followed by paralysis of thoracic movements; pulse weak and rapid; respiration shallow; stertorous, labored; great fall of body-temperature; dropping of jaw.	Remove ether; invert patient; hypodermic injections of strychnin, atropin, ammonia intravenously, digitalis; dash ether on chest and abdomen; external heat; frictions; artificial respiration. *Avoid* subcutaneous injections of ether and alcohol.
Gelsemium (yellow jasmine).	Dropping of jaw; ptosis; sense of languor, drowsiness; great muscular relaxation; pulse rapid, feeble; skin moist, cold; face anxious; loss of voice; respiration slow, labored; impaired sensibility; disturbed vision; which is sometimes double; pupils dilated; great fall of body-temperature.	General, especially cardiac, stimulation; ammonia; digitalis; emetics; stomach-pump; atropin; strychnin; external heat.
Hyoscyamus (henbane).	See "Belladonna."	
Iodin (potassium iodid).	Violent gastro-enteritis, vomiting and purging; metallic taste in mouth; marked salivation; pulse rapid and feeble; face deathly pale; total suppression of urine; sometimes swelling of eyelids; laryngeal pain; excessive thirst; high fever; albuminuria; cyanosis; violent excitement; convulsions, and collapse.	Large quantities of starch, wheat flour, or arrow-root boiled in water, freely; emetics; application of external heat; hypodermic injections of alcohol and digitalis, ammonia, atropin, strychnin.

A TABLE OF POISONS AND POISONING.—(*Continued.*)

DRUG.	GENERAL SYMPTOMS.	ANTIDOTES AND TREATMENT.
Iodoform.	Drowsiness; slight delirium; rapid pulse; high temperature.	
Jaborandi (pilocarpin).	Vertigo; salivation; profuse sweating; purging; vomiting; contracted pupils; pain in eyeball.	Evacuate stomach; stimulants.
Lead.	Sweet, metallic taste in mouth; pain in epigastrium; severe gastro-intestinal irritation; matters vomited white, passages black; sometimes constipation; pulse rapid, tense, cord-like, then weak and relaxed; face anxious, pinched and livid; excessive thirst; cramps in legs; muscular twitching; vertigo, anesthesia; stupor, convulsions, coma; death.	Soluble sulfates, especially sodium and magnesium, best chemical antidotes. Emetics or stomach-pump; mucilaginous or albuminous drinks; application of external heat; opium to allay irritation.
Lobelia.	Great prostration; nausea, vomiting; sometimes violent purging; cold sweating; livid face; skin pale; pulse feeble; sometimes burning in fauces and esophagus: muscular tremblings, convulsions, stupor, coma.	Washing out stomach with solution of tannic acid; opium to allay irritation and pain; alcohol, ammonia, strychnin, digitalis, hypodermically; external heat.
Mercury (bichlorid of, or corrosive sublimate).	Intense gastro-enteritis; metallic coppery taste in mouth; sense of constriction in throat; burning pain in esophagus and stomach; colicky pains, diarrhea; vomiting: mucus, bilious, bloody; purging: serous, mucus, bloody; much straining; breath fetid; pulse small, frequent, irregular; face pinched, anxious; cold extremities; convulsions, coma, collapse; if somewhat protracted, petechial eruption upon skin; somewhat febrile reaction.	White of egg freely, followed by stomach-pump to wash out stomach; external heat; cardiac and respiratory stimulants.
Morphin.	See "Opium."	
Mushrooms.	Abdominal pain, nausea, vomiting, cholera-like purging, with bloody stools.	For *Amanita muscaria*, hypodermic injections of atropin; for *A. phalloides*, transfusions of fresh blood or of salt-solution; strychnin and nitroglycerin to support the heart's action.
Nicotin.	See "Tobacco."	
Nitrite of Amyl.	Great muscular relaxation with progressive loss of reflexes; yellow vision; marked pallor; *pupils dilated*; pulse slow, almost imperceptible; respiration irregular; sometimes vomiting and epileptiform convulsions.	General stimulation; strychnin hypodermically; alternate hot and cold douches; digitalis, artificial respiration.
Nitrite of Ethyl.		
Nitrite of Potassium.	Same as preceding.	Same as preceding.
Nitrite of Sodium.		

A TABLE OF POISONS AND POISONING.—(*Continued.*)

DRUG.	GENERAL SYMPTOMS.	ANTIDOTES AND TREATMENT.
Nitroglycerin.	"Queer" sensations in head; giddiness; feeling of constriction in throat; severe headache; pulse irregular; dilated pupils; precordial pain; muscular weakness; urine scanty, pigmented; sometimes nausea and loss of consciousness; other symptoms similar to those peculiar to the nitrites.	Atropin; cold to the head; general stimulation; ergotin (?).
Oil of Bitter Almonds.	See "Hydrocyanic Acid."	
Opium.	At first drowsiness, followed by deep sleep; pulse full, slow and strong; breathing full; skin warm, dry; *pupils contracted.* Soon after, face reddened, suffused, or distinctly cyanotic: complete loss of consciousness; breathing stertorous, puffing, then marked cyanosis; respiration very slow, difficult, and not deep, but shallow; general relaxation; skin now bedewed with cold, clammy sweat; pulse rapid and feeble; coma, death.	Unload stomach by emetics, such as mustard, ipecac, or sulfate of copper; use stomach-pump; give *tannic* acid freely; strong coffee or caffein; external heat. Keep patient awake by shouting in ear, by walking him, by flagellating with wet towels, or by alternate hot and cold douches. Electricity; respiratory stimulants, atropin, strychnin; cardiac stimulants, alcohol, digitalis; artificial respiration. [Wash out stomach several times with a strong solution of potassium permanganate.—G. H. H.]
Phosphorus.	Phosphorous taste in mouth; breath laden with odor of drug; burning pain in esophagus, stomach, and abdomen; gastro-enteritis; matters vomited and purged, mucus, bile, blood, luminous in the dark; often constipation; enlarged liver; jaundice, "coffee-grounds" vomit; bile suppressed at this time; muscular twitchings, vertigo, headache, delirium; erotic convulsions; urine scanty, albuminous; unconsciousness, coma. In women, pseudo-menstrual discharge, miscarriage, abortion. Whole train of symptoms resembles *yellow atrophy of liver.*	Sulfate of copper; old French oil of turpentine; best of all, perhaps, *potassium permanganate*, acting as a perfect chemic antidote, 0.2 to 0.3 per cent. solution; mucilaginous drinks; emetics, purgatives; opium to allay irritation; *fats* or *oils should not be given.*
Physostigma.	See "Calabar Bean."	
Pilocarpin.	See "Jaborandi."	
Quinin.	Deafness; blindness; erythematous eruptions; epistaxis; symptoms of congestion.	Tannic acid; general stimulation; alcohol, ammonia, strong coffee; artificial respiration.
Sabadilla.	See "Veratrum Sabadilla."	

A TABLE OF POISONS AND POISONING.—(*Continued.*)

DRUG.	GENERAL SYMPTOMS.	ANTIDOTES AND TREATMENT.
Sanguinaria.	Gastro-enteritis; profuse salivation; violent vomiting and purging; faintness, vertigo; disordered vision; coldness; general insensibility; great thirst; pulse slow; great muscular prostration; *dilated pupils;* clonic convulsions.	Tannic acid (?); general stimulation; atropin, strychnin, digitalis.
Savin.	Abdominal pain, vomiting, tenesmus and bloody stools; convulsions; respiratory disturbances; coma; collapse.	Stomach-pump; castor oil; morphin; abdominal poultices.
Silver (Salts of).	Diarrhea; pains; vomiting of white, cheesy matter which turns black in sunlight; dizziness; convulsions; paralysis; coma; respiratory disturbance.	Salt and water; milk in large quantities; evacuate stomach.
Stramonium (Jamestown weed).	See "Belladonna."	
Strychnin.	Sudden muscular rigidity; stiffness of back of neck; uneasy startings, followed by tetanic convulsions; opisthotonos, feet everted; slight touch or breath of air originates convulsions; complete relaxation between convulsions; *risus sardonicus*, corners of mouth drawn back; eyes fixed, widely opened; respiration ceases during convulsion; cramp-like muscular contractions; exceedingly painful; erection of penis; involuntary defecation and urination; consciousness preserved; lockjaw late in poisoning.	Amyl nitrite by inhalation or hypodermically; tannic acid as chemic antidote in drafts of warm water. After stomach is washed out, bromid of potassium by mouth or by rectum, combined with chloral: Calabar bean; artificial respiration.
Tobacco.	Great depression; giddiness with feeling of intense wretchedness and weakness; skin cold, clammy; pulse rapid, running, finally imperceptible; dyspnea; muscular tremblings; sometimes convulsions.	Wash out stomach; respiratory and cardiac stimulants, atropin, strychnin, digitalis; Hoffman's anodyne; external heat and rubbings.
Turpentine.	Gastro-enteritis, generally preceded by giddiness and a kind of intoxication; strangury; bloody, scanty urine, with odor of violets; cyanosis; skin moist or dry; *pupils widely dilated;* pulse feeble, rapid.	Sulfates, of magnesium especially; demulcent or albuminous drinks; opium.
Veratrum Sabadilla (veratrin).	Marked loss of muscular power, soon deepening into collapse; skin pale, cold, clammy; face pinched; muscular tremors; violent vomiting; sometimes serous purging; pulse rapid, thready; convulsions resembling those of strychnin; sometimes free diuresis; body-temperature lowered.	Evacuate stomach; general stimulation, caffein or strong coffee; absolute rest; external heat.

A TABLE OF POISONS AND POISONING.—(*Continued.*)

DRUG.	GENERAL SYMPTOMS.	ANTIDOTES AND TREATMENT.
Veratrum Viride.	General pronounced muscular relaxation; intense nausea; constant retching; hiccough, faintness; vertigo; pulse at first slow, then rapid, often running, almost imperceptible; disordered vision; skin cold, clammy; semiunconsciousness; precordial pain (?); often convulsions.	Wash out stomach with drafts of warm water. Place patient in prone position, head lower than feet; check vomiting, but patient must not be allowed to arise. Laudanum by rectum; alcohol by mouth; digitalis, strychnin; atropin; ammonia hypodermically or intravenously; external heat; rubbings; mild flagellations; nitrite of amyl by inhalations.
Zinc Chlorid, Zinc Sulfate.	Pain in the abdomen; nausea, vomiting and collapse.	White of egg; mucilaginous drinks; emetics and stomach-pump.

APPENDIX.

ABBREVIATIONS USED IN MEDICINE.*

A.—Accommodation. Argon.
a, aa.—For ana, each.
Abdom.—Abdomen.
Abs. feb.—L. absente febre, when fever is absent.
A. C.—L. ante cibum, before meals.
Ad., Add.—L. addi, addatur, or addantur, add, let there be added.
Ad. def. an.—L. ad deliquium animæ, to or to fainting.
Ad delig.—L. ad deliquium, to or to fainting.
Ad 2 vic.—L. ad duas vices, at two times, for two doses.
Ad grat. acid.—L. ad gratum acidum, to an agreeable sourness.
Admd.—L. administrandus, to be administered.
Ad lib.—L. ad libitum, at pleasure—i. e., as desired.
Admov.—L. admove, admoveantur, add, let there be added.
Ad pond. om.—L. ad pondus omnium, to the weight of the whole.
Adst. feb.—L. adstante febre, while fever is present.
Adv.—L. adversum, against.
Æg.—L. ægre, ægra, the patient.
Ag.—Silver [L. argentum].
Aggred. feb.—L. aggrediente febre, while the fever is coming on.
Agit. vas.—L. agitato vase, the vital being shaken.
Alt. dieb.—L. alternis diebus, every other day.
Alt. hor.—L. alternis horis, every other hour.
Alv. adst.—L. alvo adstante, when the bowels are bound.
Alv. deject.—L. alvo dejectiones, alvine discharges.
Aq.—L. aqua, water.
Aq. æst.—L. aqua æstivalis, frozen water.
Aq. bull.—L. aqua bulliens, boiling water.
Aq. com.—L. aqua communis, common water.
Aq. dest.—L. aqua destillata, distilled water.
Aq. ferv.—L. aqua fervens, hot water.
Aq. fluv.—L. aqua fluvii, river water.
Aq. font.—L. aqua fontana, spring water.
Aq. mar.—L. aqua marina, sea water.
Aq. niv.—L. aqua nivalis, snow water.
Aq. pluv.—L. aqua pluvialis, rain water.
Aq. pur.—L. aqua pura, pure water.
Aq. rep.—L. aqua repulsa, repelled water.
A. S.—L. auris sinistra, left ear.
Av.—Avoirdupois.

* Adapted from Dorland's American Illustrated Medical Dictionary.

[illegible]

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Decub.—L. *decubitus*, lying down.
De d. in d.—L. *de die in diem*, from day to day.
Deg.—Degeneration. Degree.
Deglut.—L. *deglutiatur*, let it be swallowed.
Dep.—L. *depuratus*, purified.
Destil.—L. *destilla*, distil.
Det.—L. *detur*, let it be given.
Det. in dup., Det. in 2plo.—L. *detur in duplo*, let twice as much be given.
D. et s.—L. *detur et signetur*, let it be given and labelled.
Dieb. alt.—L. *diebus alternis*, on alternate days.
Dieb. tert.—L. *diebus tertiis*, every third day.
Dig.—L. *digeratur*, let it be digested.
Dil.—L. *dilue*, dissolve.
Diluc.—L. *diluculo*, at daybreak.
Dilut.—L. *dilutus*, dilute.
Dim.—L. *dimidius*, one-half.
D. in p. æq.—L. *divide in partes æquales*, divide into equal parts.
Dir. prop.—L. *directione propria*, with a proper direction.
Dist.—L. *distilla*, distil.
Div.—L. *divide*, divide.
Donec alv. sol. fuerit.—L. *donec alvus soluta fuerit*, until the bowels are opened.
D. P.—L. *directione propria*, with a proper direction.
dr.—Dram or drams.
D. T. D.—L. *datur talis dosis*, give of such a dose.
Dur. dolor.—L. *durante dolore*, while the pain lasts.

Ead.—L. *eadem*, the same substance.
Ejusd.—L. *ejusdem*, of the same.
Elec.—Electricity. Electuary.
Emp.—L. *emplastrum*, a plaster.
Emp. vesic.—L. *emplastrum vesicatorium*, a blister.
Enema.—Enema.
Exhib.—L. *exhibeatur*, let it be given.
Ext.—Extract. External.

F.—Fahrenheit. L. *fiat*, let there be made. Formula.
Fahr.—Fahrenheit.
Far.—Faradic.
Fasc.—L. *fasciculus*, a bundle.
Feb. dur.—L. *febre durante*, while the fever lasts.
Fem. intern.—L. *femoribus internis*, at the inner side of the thighs.
Ferv.—L. *fervens*, boiling.
F. h.—L. *fiat haustus*, let a draft be made.
Filt.—L. *filtra*, filter.
Fl.—Fluid.
F. l. a.—L. *fiat lege artis*, let it be done according to rule.
Fld.—L. *fluidus*, fluid.
Fldr.—Fluidrachm.
Flor.—L. *flores*, flowers.
Floz.—Fluidounce.
F. m.—L. *fiat mistura*, let a mixture be made.
Fol.—L. *foliæ*, leaves.
F. p.—L. *fiat potio*, let a potion be made.
F. pil.—L. *fiant pilulæ*, let pills be made.
Fract. dos.—L. *fracta dosi*, in divided doses.
Frust.—L. *frustillatim*, in small pieces.
F. s. a.—L. *fiat secundum artem*, let it be prepared skilfully.
Ft.—L. *fiat*, let it be made; *fiant*, let them be made.
Ft. mas. div. in pil.—L. *fiat massa dividenda in pilulas*, let a pill mass be made and divided into pills.
Ft. pulv.—L. *fiat pulvis*, let a powder be made.
F. vs.—L. *fiat venæsectio*, let the patient be bled.

Garg.—L. *gargarisma*, a gargle.
Gel. quav.—L. *gelatina quavis*, in any kind of jelly.
G. G. G.—L. *gummi guttæ gambiæ*, gamboge.
Gm.—Gram.
Gr.—L. *granum*, grain.
Grad.—L. *gradatim*, by degrees.
Gtt.—L. *gutta*, drop; or *guttæ*, drops.
Guttat.—L. *guttatim*, drop by drop.
Gutt. quibusd.—L. *guttis quibusdam*, with a few drops.

H.—L. *hora*, an hour. Horizontal. Hydrogen.
Haust.—L. *haustus*, a draught.
H. d.—L. *hora decubitus*, at bedtime.
Hebdom.—L. *hebdomada*, a week.
Herb. recent.—L. *herbarium recentium*, of fresh herbs.
Hg.—Hectogram. Mercury (L. *hydrargyrum*).
Hor. decub.—L. *hora decubitus*, at bedtime.
Hor. interm.—L. *horis intermediis*, at the intermediate hours.
Hor. un. spatio.—L. *horæ unius spatio*, at the end of an hour.
H. p. n.—L. *haustus purgans noster*, our own purgative draft.
H. s.—L. *hora somni*, at bedtime.

Id.—L. *idem*, the same.
II-para.—Secundipara.
III-para.—Tertipara.
In d.—L. *in dies*, daily.
Inf.—L. *infunde*, pour in.
Inj.—Injection.
Inj. enem.—L. *injiciatur enema*, let an enema be injected.
In pulm.—L. *in pulmento*, in gruel.
I-para.—Primipara.

Juscul.—L. *jusculum*, a broth.

Kg.—Kilogram.

L.—Left. Liter.
Lag.—L. *lagena*, flask.
Lat. dol.—L. *lateri dolenti*, to the painful side.
Lb.—L. *libra*, a pound.
L. D. A.—Left dorso-anterior position of the fetus.
L. D. P.—Left dorsoposterior position of the fetus.
L. F. A.—Left fronto-anterior position of the fetus.
L. F. P.—Left frontoposterior position of the fetus.
Lib.—L. *libra*, a pound.
Linim.—Liniment.
Lint.—L. *linteum*, lint.
Liq.—Liquor.
L. M. A.—Left mento-anterior position of the fetus.
L. M. P.—Left mentoposterior position of the fetus.
L. O. A.—Left occipito-anterior position of the fetus.
Loc. dol.—L. *loco dolenti*, to the painful spot.
L. O. P.—Left occipitoposterior position of the fetus.
Lot.—L. *lotio*, lotion.
L. S. A.—Left sacro-anterior position of the fetus.
L. S. P.—Left sacroposterior position of the fetus.

M.—Meter. L. *meridies*, noon; *misce*, mix. *Mistura*, mixture.
Mac.—L. *macera*, macerate.
Mag.—L. *magnus*, large.
Man.—L. *manipulus*, a handful.
Man. pr.—L. *mane primo*, early in the morning.
Manip.—L. *manipulus*, a handful.
Mas. pil.—L. *massa pilularum*, pill-mass.

Matut.—L. *matutinus*, in the morning.
M. ft.—L. *mistura fiat*, let a mixture be made.
Mic. pan.—L. *mica panis*, bread-crumb.
Min.—L. *minimum*, a minim.
Mist.—L. *mistura*, a mixture.
Mit.—L. *mitte*, send.
Mitt. sang.—L. *mitte sanguinem*, bleed.
M. L. A.—Left mento-anterior position of the fetus.
M. L. P.—Left mentoposterior position of the fetus.
Mm., mm.—Millimeter.
Mmm.—Micromillimeter.
Mod. præsc.—L. *modo præscripto*, in the way directed.
Mor. dict.—L. *more dicto*, in the manner directed.
Mor. sol.—L. *more solito*, in the usual way.

Ne tr. s. num.—L. *ne tradas sine nummo*, do not deliver unless paid.
Nm.—L. *nux moschata*, nutmeg.
No.—L. *numero*, number.
Noct.—L. *nocte*, at night.
Noct. maneq.—L. *nocte maneque*, at night and in the morning.
Non repetat.—L. *non repetatur*, do not repeat.

O.—L. *octarius*, pint.
O. D.—L. *oculus dexter*, right eye.
O. D. A.—Right occipito-anterior position of the fetus.
O. D. P.—Right occipitoposterior position of the fetus.
Ol.—L. *oleum*, oil.
O. L. A.—Left occipito-anterior position of the fetus.
O. D. P.—Right occipitoposterior position of the fetus.
Ol. oliv.—L. *oleum olivæ*, olive oil.
Ol. lini s. i.—L. *oleum lini sine igne*, cold-drawn linseed oil.
Ol. res.—Oleoresin.
O. m.—L. *omni mane*, every morning.
Omn. bih.—L. *omni bihora*, every two hours.
Omn. hor.—L. *omni hora*, every hour.
Omn. noct.—L. *omni nocte*, every night.
Om. quar. hor.—L. *omni quadrante hora*, every quarter of an hour.
O. n.—L. *omni nocte*, every night.
O. S.—L. *oculus sinister*, left eye.
O. u.—L. *oculus uterque*, either eye.
Ov.—L. *ovum*, egg.
Oz.—Ounce.

P.—L. *pondere*, by weight.
P. æ.—L. *partes æquales*, in equal parts.
Par. aff.—L. *pars affecta*, the part affected.
Part. æq.—L. *partes æquales*, equal parts.
Part. vic.—L. *partibus vicibus*, in divided doses.
Pastil.—L. *pastillum*, a pastille.
P. C.—L. *pondus civile*, avoirdupois weight.
P. c.—L. *post cibum*, after food.
Penic. cam.—L. *penicillum camelinum*, a camel's-hair brush.
Per. op. emet.—L. *peracta operatione emetici*, when the action of the emetic is over.
Pil.—Pill.
Pocill.—L. *pocillum*, a small cup.
Pocul.—L. *poculum*, cup.
Pond.—L. *pondere*, by weight.
Post sing. sed. liq.—L. *post singulas sedes liquidas*, after every loose stool.
Pot.—Potion. Potassa.
P. p. a.—L. *phiala prius agitata*, the bottle having first been shaken.
Ppt.—Precipitate. Prepared.

P. rat. ætat.—L. *pro ratione ætatis*, in proportion to age.
P. r. n.—L. *pro re nata*, according to the occasion.
Pt.—Pint. Platinum.
Pulm.—L. *pulmentum*, gruel.
Pulv.—L. *pulvis*, powder.

Q. d.—L. *quater in die*, four times a day.
Q. l.—L. *quantum libet*, as much as you choose.
Q. p.—L. *quantum placeat*, at will.
Q. Q. H.—L. *quaque quarta hora*, every fourth hour.
Qq. hor.—L. *quaque hora*, every hour.
Q. s.—L. *quantum sufficit*, a sufficient quantity.
Qt.—Quart.
Quadrupl.—L. *quadruplicato*, four times as much.
Quat.—L. *quatuor*, four.
Quinq.—L. *quinque*, five.
Quint.—L. *quintus*, fifth.
Quotid.—L. *quotidie*, daily.
Q. v.—L. *quantum vis*, as much as you like.

R.—Réaumur. Respiration.
℞.—L. *recipe*, take.
Rad.—L. *radix*, root.
Ras.—L. *rasuræ*, shavings.
R. D. A.—Right dorso-anterior position of the fetus.
R. D. P.—Right dorsoposterior position of the fetus.
Rect.—L. *rectificatus*, rectified.
Redig. in pulv.—L. *redigatur in pulver*, let it be reduced to powder.
Red. in pulv.—L. *redactus in pulver*, reduced to powder.
Reg. umb.—L. *regio umbilici*, region of the navel.
Rep.—L. *repetatur*, let it be repeated.
R. F. A.—Right fronto-anterior position of the fetus.
R. F. P.—Right frontoposterior position of the fetus.
Rham. cat.—L. *Rhamnus cathartica.*
R. M. A.—Right mento-anterior position of the fetus.
R. M. P.—Right mentoposterior position of the fetus.
R. O. A.—Right occipito-anterior position of the fetus.
R. O. P.—Right occipitoposterior position of the fetus.
R. S. A.—Right sacro-anterior position of the fetus.
R. S. P.—Right sacroposterior position of the fetus.

S.—L. *semis*, half. Sign. South pole. Sulphur.
S. A.—L. *secundum artem*, according to art.
S. A. L.—L. *secundum artis leges*, according to the rules of art.
Sat.—L. *saturatus*, saturated.
Scat.—L. *scatula*, a box.
Sc. D. A.—Right scapulo-anterior position of the fetus.
Sc. D. P.—Right scapuloposterior position of the fetus.
Sc. L. A.—Left scapulo-anterior position of the fetus.
Sc. L. P.—Left scapuloposterior position of the fetus.
Scr.—Scruple.
S. D. A.—Right sacro-anterior position of the fetus.
S. D. P.—Right sacroposterior position of the fetus.
Sed.—L. *sedes*, stool.
Sem.—L. *semen*, seed.
Semid.—L. *semidrachma*, half a dram.
Semih.—L. *semihora*, half an hour.
Sept.—L. *septem*, seven.
Seq. luce.—L. *sequenti luce*, the following day.
Serv.—L. *serva*, keep, preserve.
Sesquih.—L. *sesquihora*, an hour and a half

Sesune.—L. *sesuncia*, an ounce and a half.
Si.—Silicon.
Sig.—L. *signetur*, let it be labelled.
Sig. n. pr.—L. *signa nomine proprio*, label with the proper name.
Sing.—L. *singulorum*, of each.
Si non val.—L. *si non valeat*, if it does not answer.
Si op. sit.—L. *si opus sit*, if necessary.
Si vir. perm.—L. *si vires permittant*, if the strength will permit.
S. L. A.—Left sacro-anterior position of the fetus.
S. L. P.—Left sacroposterior position of the fetus.
S. n.—L. *secundum naturam*, according to nature.
Sol.—Solution.
Solv.—L. *solve*, dissolve.
Sp., Spir.—L. *spiritus*, spirit.
Sp. gr.—Specific gravity.
Spt.—L. *spiritus*, spirit.
Ss.—*Semis*, half.
S. s. s.—L. *stratum super stratum*, layer upon layer.
St.—L. *stet*, let it stand; *stent*, let them stand.
Stat.—L. *statim*, immediately.
Su.—L. *sumet*, let him take.
Sub. fin. coct.—L. *sub finem coctionis*, toward the end of boiling.
Sum.—L. *sumat*, let him take; *sumendum*, to be taken.
S. v.—L. *spiritus vini*, alcoholic spirit.
S. v. r.—L. *spiritus vini rectificatus*, rectified spirit of wine.
S. v. t.—L. *spiritus vini tenuis*, proof spirit.
Syr.—L. *syrup*, syrup.

T.—Temperature. Time.
Tab.—L. *tabella*, tablet.
Tal.—L. *talis*, such a one.
T. d.—L. *ter in die*, three times a day.
Temp. dext.—L. *tempori dextro*, to the right temple.
Temp. sinist.—L. *tempori sinistro*, to the left temple.
T. i. d.—L. *ter in die*, three times a day.
Tinct.—Tincture.
Tr.—Tincture.
Trid.—L. *triduum*, three days.
Trit.—L. *tritura*, triturate.
Troch.—A troche.
Tus.—L. *tussis*, a cough

U.—Unit.
Ult. præs.—L. *ultimum præscriptus*, last prescribed.
Umb.—L. *umbilicus*, the navel.
Ung.—L. *unguentum*, ointment.
Ur.—Urine.
Ut dict.—L. *ut dictum*, as directed.
Utend.—L. *utendus*, to be used.

Vehic.—L. *vehiculum*, a vehicle.
Ves.—L. *vesica*, the bladder.
Vesic.—L. *vesiculo, vesiculorium*, a blister.
Vin.—L. *vinum*, wine.
Vitel.—L. *vitellus*, yolk.
Vit. ov. sol.—L. *vitello ovi solutus*, dissolved in yolk of egg.
V. o. s.—L. *vitello ovi solutus*, dissolved in yolk of egg.
V. S.—Volumetric solution.
Vs.—L. *venæsecto*, venesection.
Vs. B.—L. *venæsectio brachii*, bleeding in the arm.

Wt.—Weight.

ZZ.—Zingiber, or ginger.

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